

# THE IRON AGE

THURSDAY, MARCH 6, 1890.

## Coke Brick for Furnace Linings.

At the last meeting of the German Society of Iron and Steel Metallurgists, F. Burgers, of Gelsenkirchen, presented a short statement of his experience with a special brick used to line the bosh and hearth of blast furnaces. It is a matter of frequent occurrence that linings 3 to 4 feet thick are soon reduced to a few inches. Then streams of water must be used to keep the walls from being destroyed. The chief reason for this rapid destruction of the refractory material is that the cinder dissolves it, fluctuating in its composi-

tion, as it does frequently from an acid to a basic cinder. Experiments made showed that the best refractory fire-brick, varying in composition, were destroyed in one or two hours when placed in the cinder run. This circumstance led Burgers to seek for another material. His attention was directed to coke. The first experiment, begun in 1892, was directed to binding with clay, coal, coke and graphite, and using the mixture in a form of brick. Dr. Otto & Co., a leading firm of German manufacturers of fire-brick, furnished a series of samples which, however, were defective in this point—that in binding the brick the carbon had been partly removed, but even this sample gave good results.

In 1885 Pourcelet, in describing the manufacture of ferromanganese at Terrenoire,

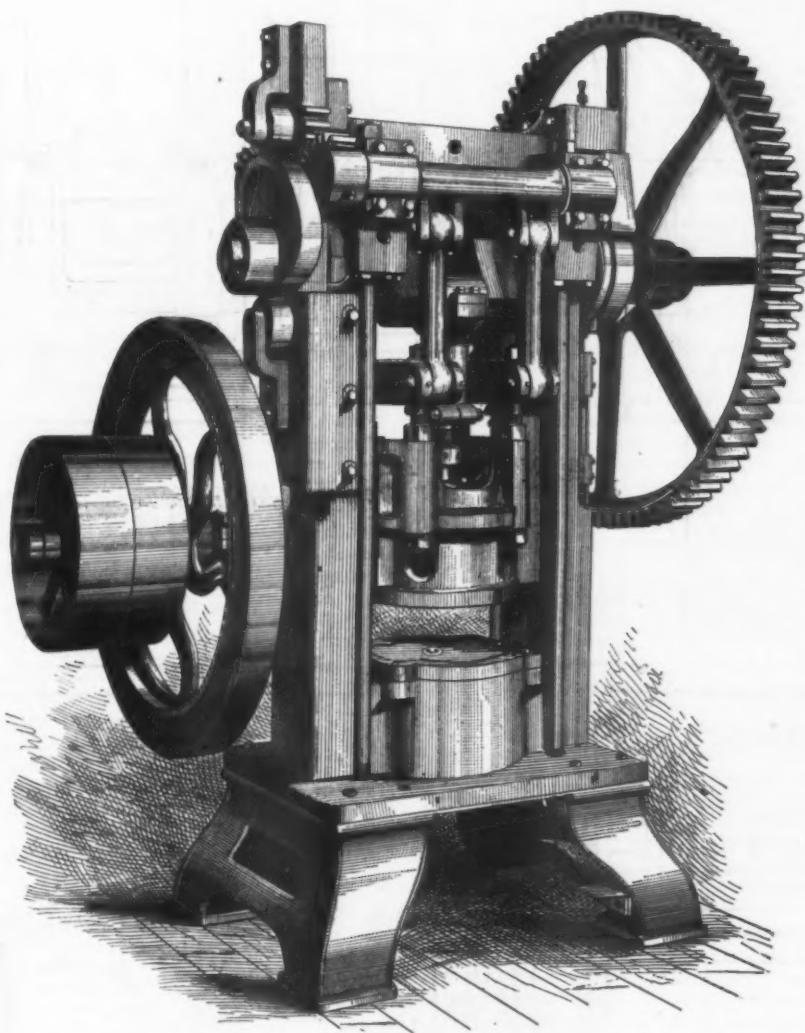
stated that the hearth and bottom of the furnace was made of graphite brick. He used as a raw material retort graphite containing 1 to 2 per cent. of ash, ground it, mixed it with tar, formed it into brick and then heated it. A part of the tar cokes and binds the graphite to a solid brick. Burgers had experiments made with ground coke, low in ash, instead of graphite, obtaining good results.

In 1885 No. 2 furnace of the company with which Mr. Burgers is connected, was lined with this coke brick, with excellent results. They have been introduced also with the Rheinische Steel Works and at

that an inventor could not sell his invention or put it into use, and afterward obtain a patent and enjoin the use of the very machines constructed or sold by him. Judge Blodgett sustained this defense, and dismissed the plaintiff's suit.

## Drawing Press.

A new and notable feature in this press, which in other respects is not unlike the regular styles of toggle drawing presses, consists in the manner of working the toggles. There are two rock-shafts mounted



DRAWING PRESS, BUILT BY DETRICK & HARVEY MACHINE COMPANY.

tion, as it does frequently from an acid to a basic cinder. Experiments made showed that the best refractory fire-brick, varying in composition, were destroyed in one or two hours when placed in the cinder run. This circumstance led Burgers to seek for another material. His attention was directed to coke. The first experiment, begun in 1892, was directed to binding with clay, coal, coke and graphite, and using the mixture in a form of brick. Dr. Otto & Co., a leading firm of German manufacturers of fire-brick, furnished a series of samples which, however, were defective in this point—that in binding the brick the carbon had been partly removed, but even this sample gave good results.

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Rombach. At Mechernich the same material has been used for lining lead furnaces. During the course of a brief debate upon the subject Burgers stated that the cost of the brick is about 100 marks per ton.

Judge Blodgett, on the 25th ult. at Chicago, decided a question of more than usual interest to inventors and manufacturers. The case was that of the Dable Grain Shovel Company against Flint, Odell & Co., in which the defendants were sued for \$100,000 for infringement of two patents granted to John Dable for improvements in machines for unloading grain from railroad cars—the improvements relating specially to mechanism for unloading grain by steam instead of by hand. The argument of the defense was

in capped bearings with vertical joints at the top of the machine, and to these are attached links which in turn are made fast by suitable mechanism to the cage or blank holder. On one end of each shaft is mounted a segment of a spur gear which engages with a vertical rack, moving in guides formed on the frame of the press. This rack is moved by a cam that is keyed on the end of the crank shaft. A top and bottom roller on this vertical rack receive their motions from the periphery of the cam. The pins which carry these rollers are supported at both ends.

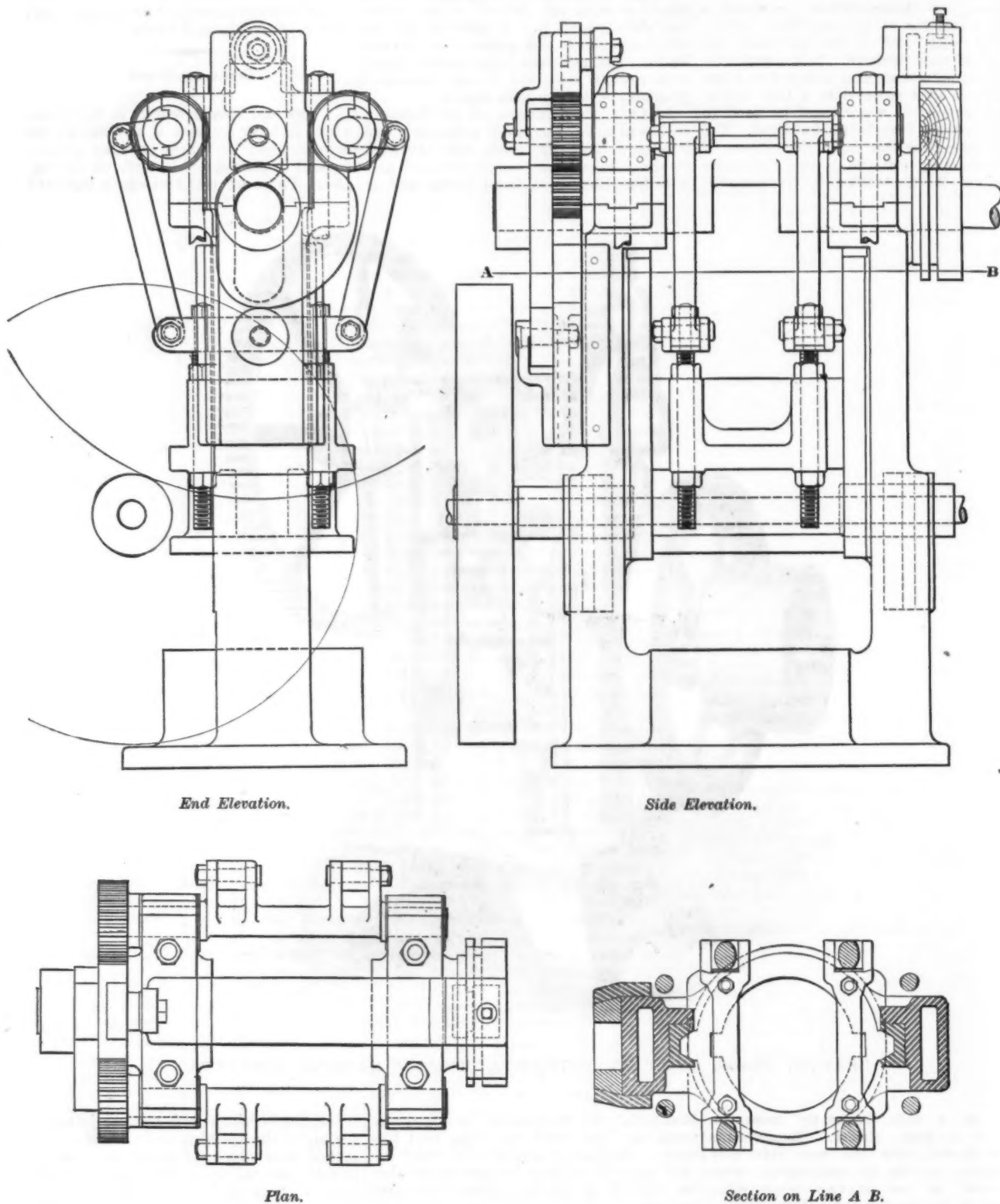
The shape of the cam gives one-quarter dwell at the top and one-quarter at the bottom, the other half being used for the up and down stroke. The one-quarter dwell at the bottom holds the cam down sufficiently long to allow the punch to do

its work before the blank is released. The rollers and cam having their bearing faces always in contact give a soft, easy motion and operate without noise or jar. Another very desirable feature in this press consists in having the construction such that the whole top can be lifted up when the shaft is to be removed. This top is held down by eight bolts and

**Seal Press Suit Decided.**—Over a year ago the Buffalo Seal and Press Company, through their counsel, Howson & Howson, brought suit in New York against the New York Railway Press and Seal Company, for infringement of the Abbe patent for a seal press for pressing the leaden seals on wires for sealing card doors. These lead seals and the hand tools to press the

decree in favor of the Buffalo company, sustaining the patent and granting an injunction restraining the infringement of complainant's rights under the patent.

There is now, and has been for several months, a scarcity of puddlers in the Pittsburgh district. The starting up of



in addition thereto four large bolts running through the top of the press to the bottom of the frame, making it strong and rigid. Steel castings are used in many places instead of iron. All pins are of steel, surfaces are large and the press throughout heavy and substantial.

The machines are built by the Detrick & Harvey Machine Company, of Baltimore, Md.

seals on the wires are largely used by railroads all over the country. The characteristic feature of the Abbe patented press is that it provides for the sidewise insertion of the seals and wires between a pair of rolling dies. The case came up for final hearing before Judge Wallace in the United States Circuit Court for the Southern District of New York, on Monday, the 24th ult., and on the 26th the judge signed a

nearly all the iron mills to their utmost capacity has caused a scarcity of men in this branch of work. Several mills would start up additional puddling furnaces if they could procure competent workmen.

It is said that the new rolling stock of the Reading Railroad, including 50 locomotives recently ordered and 4000 gondola cars for the coal trade, will cost \$2,500,000.



# The Properties of Aluminum--II.\*

BY ALFRED E. HUNT, JNO. W. LANGLEY.  
AND CHAS. M. HALL.

**Practical Hints.**—*Dipping and Pickling.*—Remove the dirt and grease from the plates by dipping in benzine. To whiten the metal, leaving on the surface a beautiful white mat, the sheet should be first dipped in a strong solution of caustic potash. This solution should then be dipped in a mixture of concentrated acids, two parts nitric acid; then in a solution of undiluted nitric acid; then in a mixture of vinegar and water, equal parts; then washed thoroughly in water and dried as usual in hot sawdust.

*To Polish.*—Use a fine polishing composition, or rouge, or tripoli, and a sheepskin or chamois skin buff, although it is often polished with an ordinary rag buff. For fine work, to polish aluminum, use a mixture of equal parts, by weight, of olive oil and rum, made into an emulsion by being well shaken together in a bottle. The polishing stone is dipped in this liquid, and the metal is polished, without using, however, too much pressure. Aluminum may be easily ground by using olive oil and pumice. The surface of aluminum, treated with varnish of four parts oil of turpentine to one of stearic acid, or with a mixture of olive oil and rum shaken into an emulsion, allows an engraving tool to work on aluminum as on pure copper.

*For Burnishing.*—Use a blood stone or steel burnisher. For hand burnishing use either kerosene oil or a solution composed of two tablespoonsful of ground borax, dissolved in about a quart of hot water, with a few drops of ammonia added.

*For Lathe Work.*—The burnisher should wear upon the fingers of his left hand a piece of cotton flannel, keeping it soaked with kerosene, and bringing it in contact with the metal, supplying a constant lubricant. Very fine effects can be produced by first burnishing or polishing the metal and then stamping it in polished dies, showing unpolished figures in relief.

*Scratch Brushing.*—Polish or burnish the surface and then use a fine steel scratch brush. A very fine finish is attained by rubbing with ground pumice stone and water. In spinning aluminum, plenty of oil should be used to prevent the clogging of the tool and to make it cut smooth in the turning and to assist in the spinning.

*To Solder the Metal.*—Soldering the metal in large surfaces has not been successfully accomplished up to the present. Small surfaces of the metal can be readily soldered by the use of pure zinc and venetian turpentine. Place the solder upon the metal with venetian turpentine and heat gently with a blow-pipe until the solder is melted. It will then be found to have fixed itself firmly to the aluminum. The trouble with this, as with other solders, is that it will not flow on the metal. Therefore large surfaces are not easily soldered. In cold-rolling aluminum, upon roll designed for cold-rolling hard crucible steel, it has been found possible to reduce aluminum through the same sections as hard steel; the aluminum required, on the average, five annealings, where the steel required three to satisfactorily withstand the same work.

## ALLOYS OF ALUMINUM AND COPPER.

Ten per cent. of aluminum with 90 per cent. copper (called 10 per cent. aluminum bronze) rolled into plates has an elastic limit of 70,000 to 80,000 pounds per square inch, a reduction of area of from 20 to 40 per cent., with an elongation of from 5 to 10 per cent. in 8 inches. The metal

is a beautiful yellow color, and susceptible of taking a fine polish. One great advantage of the metal is its freedom from corrosion from the action of the air, either moist or dry, or water upon it. Its specific gravity in castings is about 7.84 and in rolled sheets about 7.89. Its modulus of elasticity is about 18,000,000 pounds. In castings it has a tensile strength of between 70,000 and 80,000 pounds per square inch, with a reduction of area of about 20 per cent.

Compression tests upon 10 per cent. aluminum bronze  $\frac{1}{4}$  inch diameter and 2 inches long gave an ultimate compressive strength of 160,000 pounds per square inch, the specimens being shortened by  $\frac{1}{4}$  inch. A similar piece of 5 per cent. bronze was shortened to  $1\frac{1}{4}$  inches, and gave an ultimate compressive strength of 153,000 pounds per square inch.

Five per cent. aluminum bronze in tension has an elastic limit of about 50,000 lbs. per square inch; a tensile strength of about 70,000 lbs. per square inch; a reduction of area of from 30 to 50 per cent. Its specific gravity is from 8.20 to 8.30. Two and one-half per cent. aluminum bronze has a specific gravity of 8.6. The melting point of 10 per cent. aluminum bronze is about 1700 degrees Fahrenheit—a little higher than that of ordinary brass. The metal shrinks a little less than  $\frac{1}{4}$  inch to the foot, or a little less than ordinary brass. It solidifies very rapidly from the molten condition, and it is necessary to pour it very quickly. The feed-gates should be made large enough to prevent the metal freezing. Hot baked sand molds should be used for casting. Precautions should be taken also to prevent oxidation of the metal, for without it the oxide is carried into the metal, which prevents its rolling into sheets. It is well also to bottom pour the metal into the mold—that is, to cast the metal into a hot ladle, having a nozzle in the bottom in direct connection with the gate of the casting, allowing the metal to settle, so that the oxide and dross shall come to the surface, in this way preventing its entering into the castings below. The surface of the molten bath should be kept covered with powdered charcoal. It is also advantageous to keep the bath covered with a flux in some cases, although the disadvantage of this is that the flux is apt to cut the sides of the pot and add silicon to the metal. It is well to tap the metal in an inert atmosphere (casting in a cloud of smoke or the like) to prevent the oxidation from the air in the mold attacking the metal.

Aluminum bronze is an extremely dense, close metal. It can be worked at a bright red heat as easily as can wrought iron. In this respect it differs from all other forms of bronze, which are red short at a red heat. The fact that Aluminum bronze is malleable at a red heat, and stands this temperature without change, makes it especially adaptable for blast furnace tuyers. The metal can be hardened to a considerable extent by working without annealing. To anneal aluminum bronze, heat to a dull red heat and permit it to cool gradually.

The alloy of aluminum and copper does not volatilize at any ordinary temperature used in fusing it, and consequently it can be frequently re-melted without any appreciable change in the chemical constituents of the metal. This has great advantages in the economic use of the metal, as the scrap in castings or rolling can be readily re-melted into ingots of the same quality metal.

Aluminum bronze can be brazed as well as any other metal, using as a solder: Zinc, 50 per cent.; copper, 50 per cent.; using  $\frac{1}{4}$  of the solder and  $\frac{1}{4}$  borax and cryolite in equal parts. With pure aluminum as now manufactured by The Pittsburgh Reduction Company, very pure aluminum bronze alloys can readily be made; the impurities

in the aluminum being reduced to  $\frac{1}{16}$  their amount on being diluted with pure electrolytic lake copper.

The following are some of the analyses of aluminum bronzes lately made by The Pittsburgh Reduction Company, and by the Scovill Manufacturing Company:

Constituents.	Kinds of Alloy.			
	10 Per Cent. Bronze Casting, made Dec. 5, 1889.	5 Per Cent. Bronze Casting, made Dec. 5, 1889.	2½ Per Cent. Bronze Casting, made Dec. 5, 1889.	10 Per Cent. Bronze Casting, made at Neuhausen.
Aluminum....	9.20	4.70	2.35	6.32
Copper.....	90.60	94.84	97.29	91.98
Graphitoidal Silicon.....	0.117	0.080	0.050	0.090
Non-Graphitoidal Silicon.....	0.370	0.320	0.200	1.080
Iron.....	0.077	0.060	0.050	0.480
Specific Gravity.....	7.00	8.25	8.61	8.01

## ALLOYS OF ALUMINUM AND IRON.

*Aluminum in Wrought Iron.*—The influence of aluminum in making wrought iron fluid has been taken advantage of in the well-known Mitis process of making castings of wrought iron. Aluminum furnished by the Pittsburgh Reduction Company has been found to be very advantageous and is largely used in the manufacture of the Mitis metal. Aluminum will also increase the tensile strength of wrought iron and improve the fiber, if added either as pure metal or in the form of ferroaluminum to the molten bath, just before the metal comes to nature in the puddling furnace.

*Aluminum in Cast Iron.*—The influence of aluminum in cast iron is to turn the combined carbon to graphite—that is, to make the white iron gray and also to close the texture of the metal. (W. J. Keep.) It makes the metal ordinarily more fluid and it also makes it susceptible of taking a better polish and retaining it free from oxidation. Aluminum will also increase the tensile strength of many grades of cast iron and aids in obtaining sound castings free from blow-holes. It has been used in preparations from one-tenth of 1 per cent. to 2 per cent. with good results, with various grades of iron.

*Aluminum in Steel.*—The influence of aluminum in steel of high carbon is to turn the carbon combined into graphite, and destroys the hardening action of the carbon in tool steel. Aluminum in this sense softens steel. In structural steel of 20 per cent. carbon a small amount of aluminum, up to 1 per cent., increases the tensile strength without to any great degree decreasing the ductility. By its aid a higher tensile strength can be obtained in thick sections of steel which have been subjected to but little work, than can be otherwise obtained; although aluminum with considerable quantities of graphitoidal silicon have been added to steel, no graphitoidal silicon has been found in the steel afterward, it being all found in the amorphous or combined state in the resulting steel. The influence of aluminum also is to lower the melting point of the steel and in this way make it more fluid. Its influence, also, is to make the ingots of steel more solid and free from blow-holes. It can be most advantageously used in proportions of from  $\frac{1}{16}$  of 1 per cent. up to 3 per cent. of aluminum.

*The Ores of Aluminum.*—As considerable inquiry has been made as to the ore from which aluminum is made, it may be well to state here that aluminum is now being manufactured from the oxide, alumina, which is purified chemically from

\* Read at the Washington Meeting of the American Institute of Mining Engineers.

Tests of Iron and Steel Containing Aluminum.

Articles.	Elastic limit per square inch.	Tensile strength per square inch.	Per cent. elongation per square inch.	Per cent. reduction of area.	Character of fracture.	Analysis.				
						Per cent. aluminum.	Per cent. carbon.	Per cent. manganese.	Per cent. silicon.	Per cent. phosphorus.
All iron muck bar rolled at union mills.....	27,300	40,500	28.00	36.08	Fibrous					
Three parts all iron, with two parts aluminum muck.....	26,800	49,000	29.25	40.32	Fibrous					
All aluminum muck bar	29,500	55,300	14.00	22.56	Fibrous					
Four parts all iron, with one part aluminum muck.....	28,510	49,190	29.50	37.34	Fibrous					
Open-hearth, steel with one-tenth of 1 per cent. aluminum.....										
Open-hearth steel, with one-tenth of 1 per cent. aluminum, $\frac{3}{4}$ inch thick plates.....	40,250	58,500	30.10	63.82	Silky cupped	0.04	0.12	0.41	0.02	0.05
Open-hearth steel, with one-tenth of 1 per cent. aluminum, 1 inch thick plates.....	47,950	68,360	25.30	52.10	Silky cupped	0.07	0.16	0.46	0.03	0.06
Open-hearth steel, with one-tenth of 1 per cent. aluminum, $\frac{1}{2}$ inch thick bar steel.....	46,300	63,750	26.10	47.90	Silky cupped	0.03	0.16	0.39	0.02	0.05
Open-hearth steel, with one-tenth of 1 per cent. aluminum, $\frac{1}{4}$ inch thick bar steel.....	45,980	67,500	29.20	54.80	Silky cupped	0.06	0.15	0.55	0.04	0.05

silica and iron, from the native bauxite mineral. Bauxite is found in considerable quantities, and fully as pure in quality as the best foreign mineral, in the States of North Carolina and Georgia, and there are vast deposits of it in Ireland and Northern France. The average composition of bauxite is about as follows:

Location and Kind of Bauxite.

Constituents.	White from France.	Brownish red from Revest, France.	Oolitic from Allauch, France.	White from Ireland.	White from Georgia.	Reddish from Georgia.
Alumina, $\text{O}_2\%$ .....	58.10	57.60	55.40	40.44		
Silica, $\text{Si}\%$ .....	21.70	2.80	4.80	20.60		
Oxide of iron, $\text{Fe}\%$ .....	3.00	25.30	24.80	2.37		
Water, $\text{H}_2\%$ .....	14.00	10.80	11.60	23.46		
Titanic acid, $\text{Ti}\%$ .....	3.20	3.50	3.70	6.24		
Carb. of lime $\text{CaC}\%$ .....	trace	0.40	0.20	0.85		
Authority.....	Dana	Dana	Dana	Pittsburgh Reduction Works.		

The two methods of purification of bauxite are as follows:

Bauxite, or a rich clay, chosen as free from iron as possible, is roasted at a low red heat and afterward is treated with sulphuric acid, which combines with the alumina present, forming sulphate of alumina. This is readily dissolved by water, leaving the great bulk of silica and iron behind. The solution of sulphate of alumina is allowed to settle, the supernatant liquid syphoned off into an evaporating tank and evaporated to dryness. The dry sulphate of alumina is calcined at a red heat, driving off the sulphuric acid, leaving as a residue anhydrous alumina. This calcination seems to be as easy as the calcination of alumina hydrate, and there appears to be no difficulty in condensing the volatilized sulphuric acid, which can be used over again. This process is easier, on a laboratory scale, than the soda carbonate method, which is about as follows:

Bauxite is fused with carbonate of soda in a reverberatory furnace. The fused mass is lixiviated with water, which dissolves aluminate of soda, which is decanted off. The solution of aluminate of soda is decomposed by carbonic acid gas, which forms carbonate of soda, which remains in solution, and the aluminate hydrate is precipitated. This alumina hy-

drate is afterwards washed repeatedly with water, dried, and calcined at a red heat for a considerable time, which forms anhydrous alumina.

The following is a list furnished to us by D. R. Lean, of Pittsburgh, of the Ford & Moncur fire-brick hot-blast stoves which were either built or under contract up to the first of the present year in the United States and Great Britain:

	Stoves working.	Stoves building.
Barrow Hematite Iron and Steel Company..	7	..
Distington Iron Works, Cumberland.....	4	1
Springvale Furnaces, Wolverhampton.....	5	..
Mostyn Iron Works, Mostyn.....	3	..
Darwen Iron Company, Darwen.....	3	..
Maryport Iron Works, Maryport.....	4	..
Cammell & Co., Darwen Works.....	4	3
North Lonsdale Iron Company, Ulverston	3	..
Carnforth Hematite Iron Works.....	..	3
Greenlane Furnaces, Walsall.....	2	..
Whitehaven Iron Works, Cleator Moor.	4	5
Lonsdale Iron Works, Whitehaven.....	..	2
Blaenavon Company's Works, South Wales.	..	1
Swansea Hematite Iron Works, Landore.....	..	1
Carron Company's Falkirk Works.....	2	..
Dalmellington Works, Ayrshire.....	4	..
Coltness Iron Works, Newmains.....	4	..
Summerlee Iron Works, Coatsbridge.....	..	2
Gartsherrie Iron W'ks, Coatsbridge.....	..	2
United States Union Rolling Mill Company, Cleveland.	2	..
Talladega Iron and Steel Company, Talladega, Ala.....	3	..
Total.....	54	20

The Russians, it is learned, are still adding to their fleet. Two large iron-clads are to be built in England of great propelling power, and armed with the largest Krupp guns in use afloat. Two others are being built at the Black sea arsenals, a large belted cruiser of 10,000 tons displacement at Cronstadt, and a

French company has under construction an iron-clad of 9,000 tons displacement. Besides these the Gaugut, an armored cruiser of 6,000 tons, and a protected cruiser of 2,500, are well advanced. The Russians are building also a new armored vessel of 1000 tons, called the Grozaschtschy, of a type as yet untried.

### Destination of Exports From New York.

The following shows the exports of domestic produce and merchandise from New York to all foreign ports during the last calendar year:

Exports of Domestic Merchandise from the Port of New York in 1889.

Country.	Value.
Argentine Republic.....	\$6,910,195
Austria.....	97,453
Belgium.....	13,542,870
Bolivia.....	6,661
Brazil.....	5,907,020
Costa Rica.....	622,727
Guatemala.....	544,521
Honduras.....	352,331
Nicaragua.....	619,543
San Salvador.....	431,508
Chili.....	2,290,217
China.....	3,114,316
Denmark.....	2,755,776
Danish West Indies.....	515,429
Ecuador.....	619,695
France.....	16,589,084
French West Indies.....	1,396,392
Miquelon, Langley, &c.....	45,127
French East Indies.....	241,996
French Possessions in Africa.....	154,943
Germany.....	32,654,052
England.....	139,948,171
Scotland.....	17,078,866
Ireland.....	734,366
Gibraltar.....	353,429
Nova Scotia and New Brunswick.	657,299
Newfoundland.....	1,094,627
British West Indies.....	7,185,376
British Guiana.....	1,440,690
British Honduras.....	208,874
British East Indies.....	5,399,951
Hong Kong.....	964,548
British Possessions in Africa.....	2,622,739
British Possessions in Australasia.	7,420,817
British Possessions, all other.....	357,370
French Guiana.....	6,192
Hayti.....	4,661,320
Italy.....	4,430,857
Japan.....	2,504,186
Liberia.....	51,618
Mexico.....	4,508,529
Hawaiian Islands.....	54,917
Netherlands.....	11,118,851
Dutch West Indies.....	645,271
Dutch Guiana.....	112,128
Dutch East Indies.....	2,351,022
Peru.....	977,427
Portugal.....	2,036,605
Azores, Madeira, &c.....	79,008
Roumania.....	9,261
Russia.....	656,353
San Domingo.....	1,098,810
Spain.....	2,742,445
Cuba.....	9,663,504
Porto Rico.....	1,962,466
Philippine Islands.....	177,158
Spanish Possessions in Africa, &c.	173,789
Sweden and Norway.....	2,077,807
Switzerland.....	31,925
Turkey.....	240,485
United States of Colombia.....	2,346,274
Uruguay.....	2,542,490
Venezuela.....	4,029,798
All other countries in Asia.....	409,489
All other countries in Africa.....	215,816
All other countries.....	9,274
Total.....	\$336,784,763

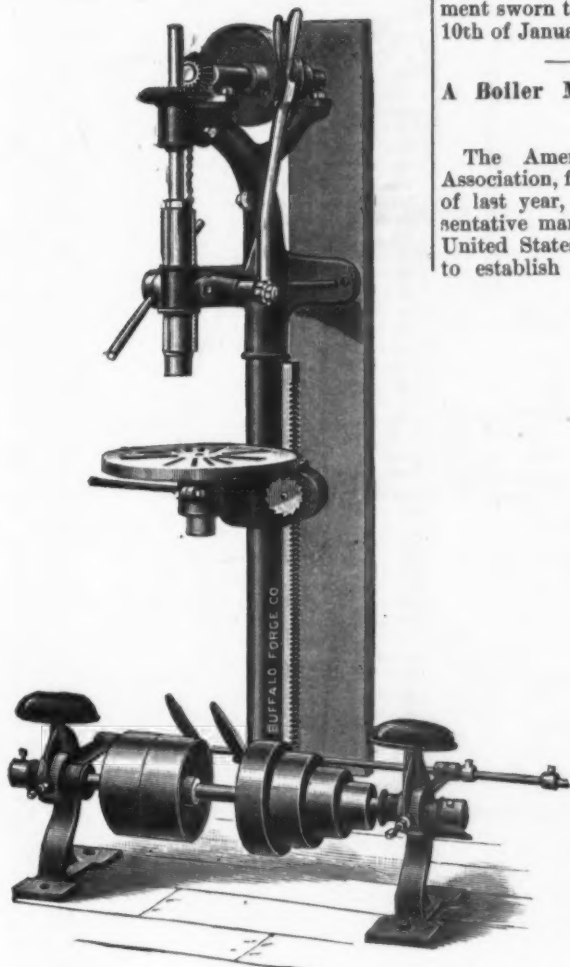
The new heating system to be introduced by the Pennsylvania Railroad Company on more than 1200 cars now in service will cost \$250,000, but the change is expected to be of pecuniary advantage, as the engines will burn only a little more coal than at present in order to heat the cars. In case of accident there would be no danger either from scalding or fires, as proved by successful experiment. This action being voluntary is expected to have much influence upon roads in other States.

Laborers in the Connellsville coke region, Pennsylvania, have decided to organize general stores on the co-operative plan.



## Upright Power Drills.

The engravings here presented represent two new patterns of a line of drilling machines made by the Buffalo Forge Company, of Buffalo, N. Y. Both machines have cut gears, running noiselessly, and the spindles take a  $\frac{1}{4}$ -inch Morse taper shank, and will drill up to a  $\frac{1}{4}$ -inch hole. The larger machine will drill to the center of a 20-inch circle and is provided with an attachment, especially adapted and designed for the work of carriage and wagon makers, for carrying wheels when drilling the tire. This machine is arranged for four changes of speed and is provided with adjustable bed for raising and lowering to meet the demands of different classes of work. It weighs 320 pounds and is 66



UPRIGHT POWER DRILLS.

inches in height. The smaller machine will drill to the center of an 11-inch circle, has three changes of speed, is 50 inches high and weighs 150 pounds.

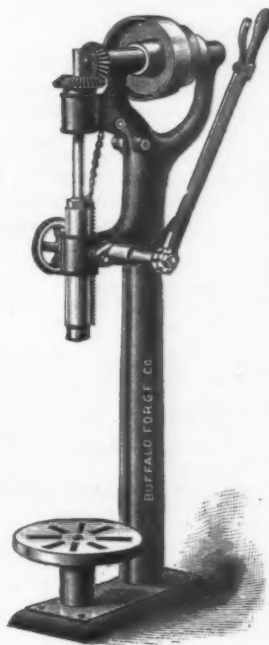
The new design of countershaft shown with the large drill is adapted for tight and loose pulleys, and is made in suitable sizes for the smaller power drills. The bearings are of ample size, are solid (not babbitted), and are bored out and reamed to gauges of cast iron. It is made with hanger and shipper arm all of one piece, which is a great convenience in putting up the hanger. The length of the countershaft is 32 inches, diameter of pulley 8 inches, and it should be run at 250 revolutions a minute.

George C. Tichenor, Assistant Secretary of the Treasury, has addressed the following letter to the Collector of Customs of New York: "On the exportation of embossed tin trays, manufactured by the Palmer Mfg. Company, of New

York City, from imported tin plates, a drawback will be allowed equal in amount to the duty paid on the imported material used in the manufacture, less the legal retention of 10 per cent. The quantity of the material so used will be determined by adding to the net weight of the exported trays, ascertained by a United States weigher, the following percentages of such weights: For the 10-inch round trays, 41 per cent.; for the 12-inch round trays, 41 per cent.; for the 13-inch round trays, 37 per cent.; for the 14-inch round trays, 27 per cent.; for the 8 x 11 oval trays, 66 per cent.; for the 13-inch square trays, 9 per cent.; for the 11 x 14 oblong trays, 7 per cent. The manufacturer's oath to the export entry must be set forth, in addition to the usual averments that the articles named in the entry were made from sheets and blanks of the sizes and weights shown in the statement sworn to by the manufacturers on the 10th of January, 1890."

## A Boiler Makers' Insurance Association.

The American Boiler Manufacturers' Association, formed in Pittsburgh in April of last year, and composed of the representative manufacturers of boilers in the United States and Canada, has concluded to establish an insurance association of



nothing of the practical part of the boiler trade and whose only object seems to be to make money out of the business regardless of our interests in the matter; therefore we must take prompt and earnest action, organize against them with the same energy that we exhibited when we formed our association, and work together for our own interests and for the interests of every community. Let us present a solid phalanx against the avaricious and conscienceless corporations which have grown rich by imposing on the credulity of the public and of ourselves. Let us give the world the benefit of the experience of men who have spent long lives in gaining practical knowledge of the boiler trade, and whose experience and integrity is a sure guarantee that whatever is entrusted to them will be faithfully and intelligently performed.

Write to us at an early date corroborating our views that we as an association are equal to the occasion and will under all circumstances look after our own interests and those of the public.

Very respectfully,  
JAMES LAPPAN, President.  
A. T. DOUTHETT, Secretary.

Secretary Douthett is now at work preparing a prospectus to be submitted to the association at its next meeting. The stock will be taken by members of the association, and the capital will be sufficient to put the new insurance company on a competitive footing with the two companies now occupying the fields. The next meeting of the above association will be held in New York City, commencing on July 1, next.

## Wire Rod Manufacturers' Meeting.

In addition to the meeting of the structural material manufacturers held in Pittsburgh last week, mention of which is made elsewhere, the wire rod and wire nail manufacturers also held a meeting. A large number of manufacturers in this line were represented, and an earnest discussion on matters of vital interest to the trade was had. It will be remembered that some months since an effort was made by the wire rod and wire nail manufacturers to form an organization which should control the product of a majority, if not all, of the firms engaged in this line of business. The concern was to be known as the Federal Steel Company. A number of meetings were held in different cities, and for a time it looked as though the project would be put through with comparatively little trouble. At the last minute, however, several of the larger concerns refused to go into the combination and the scheme was brought to a sudden close and abandoned. The meeting held last week was called for the purpose of discussing some evils existing in the trade and to endeavor to remedy the same. It was developed during the meeting that a number of wire rod mills in the country possess certain advantages over other mills by which they are enabled to place their product on the market at a less price than mills not similarly situated. It was desired that some arrangement could be made looking to equalization in cost of production; after a long discussion on the matter, it was decided that nothing could be done at this time, and it is probable another meeting will be held before long. No action whatever of importance was taken. The representatives of the firms engaged in the manufacture of wire nails reported that the demand for wire nails is increasing rapidly and that the future was full of promise.

The Wheeling Bridge Company, of Wheeling, W. Va., organized for the purpose of constructing a four-span steel bridge from that city across the river to Martin's Ferry, Ohio, have let the contract to Ferris & Kauffman, of Pittsburgh, for its construction. The contract price is \$453,000, and the work is to be done in 10 months. The company has a capital stock of \$300,000, and will issue \$300,000 of 5 per cent. bonds. All the bonds and half of the stock is held in Pittsburgh.

its own. Under date of the 28th ult., A. L. Douthett, secretary of the association, sent to each member a copy of the following circular:

Gentlemen: We are in receipt of many letters from members of our association urging us to take steps to organize a boiler insurance company, to be known as the American Boiler Manufacturers' Insurance Company. We have heretofore said nothing regarding the matter, but owing to the fact that a prominent agent of the American Steam Boiler Insurance Company, of New York, for fear that our association might take such a step, is doing all he can against us, having said that our organization was "rotten, a myth and no good," it behooves us to take steps in our own defense and for our own rights, which we can maintain at all hazards.

It is well known to every boiler manufacturer that boiler insurance companies doing business in this country are making enormous profits out of their business and at the expense of the boiler manufacturers. We are subjected to arbitrary and oppressive obedience to unjust rules. We are compelled to submit to costly and unnecessary alterations in order to comply with the demands of men who know little or

**Machine for Grinding Plane Surfaces.**

This grinding machine, the patents for which are controlled by the Springfield Glue & Emery Wheel Company, of Springfield, Mass., belongs to that class in which one or more revolving abrading wheels are arranged to so operate upon the surface of the work as to reduce it to a true plane. The abrading medium is composed of two emery wheels of corresponding diameter, which have a common revolving and laterally-reciprocating movement and a common vertical adjustment, and in addition each wheel can be independently adjusted both laterally and vertically. The upright arm of the frame is formed with a vertical face of considerable area and on which a head-block is adapted to move vertically. On the head-block is placed a cross-head arranged so as to have free lengthwise movement. This provides for the adjustment of the grinding wheels vertically and horizontally. The wheels are also so arranged on the cross-head that they can be adjusted vertically or horizontally independently of each other. On each of the shafts carrying the wheels is mounted a pulley by means of which the wheels are revolved by belts driven by a suitable countershaft. The lateral adjustment of the wheels is for the purpose of gauging the distance between them according to the width or diameter of the work to be operated upon, while the vertical adjustment is for the purpose of compensating for unequal wear of the wheels by slightly depressing the one which wears away most quickly.

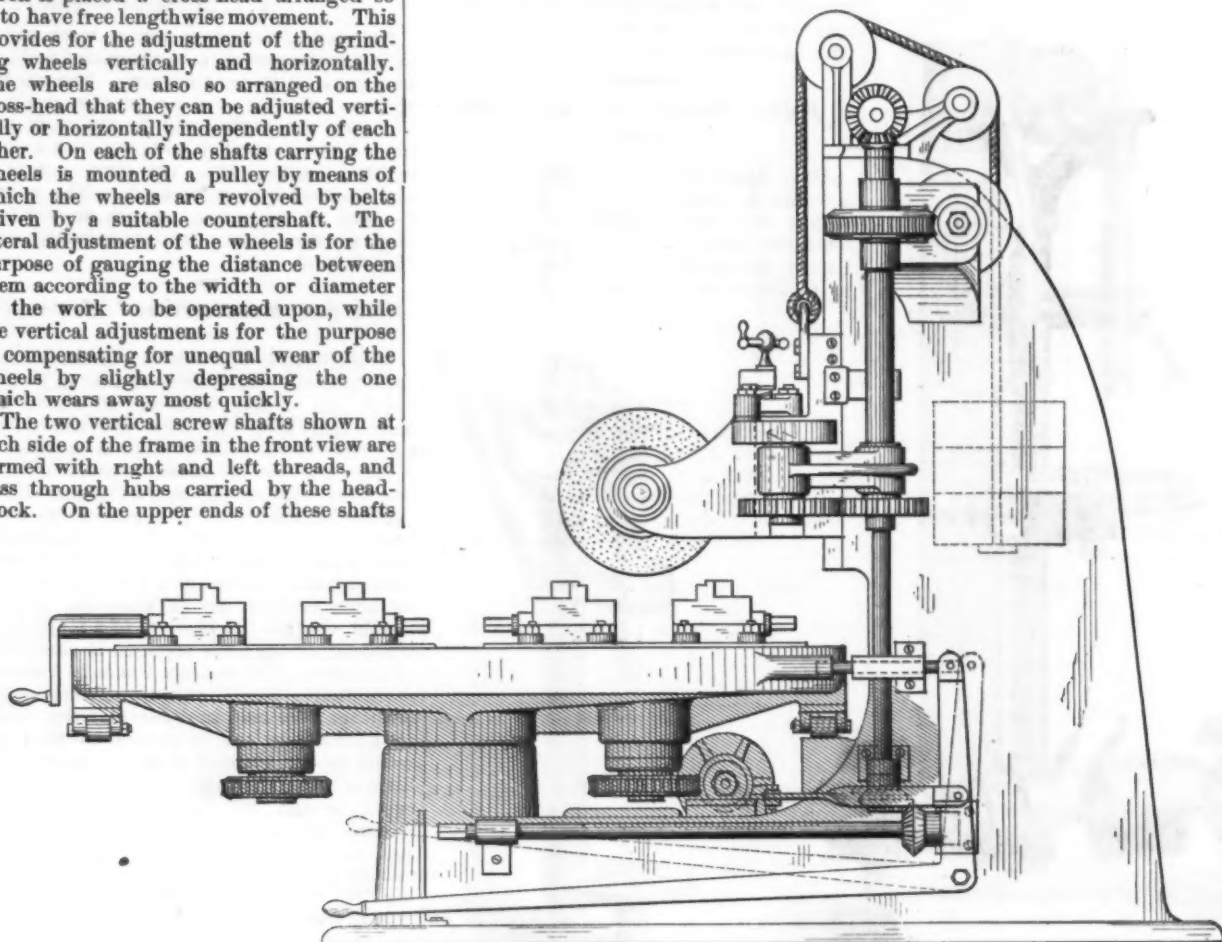
The two vertical screw shafts shown at each side of the frame in the front view are formed with right and left threads, and pass through hubs carried by the head-block. On the upper ends of these shafts

A link connects the crank-pin with the cross-head. The revolution of the worm shaft by suitable belt and pulley will impart a horizontal reciprocating movement to the cross-head and wheels, and the amount of this movement can be changed as necessary by adjusting the crank pin. This compound revolving and reciprocating movement of the wheels greatly increases the speed of reducing the surface of the work; but this result is still further augmented by the revolving movement imparted to the work itself in a plane at right angles to the plane of revolution of the wheels. In the machine here shown there are two work holding mechanisms, one of which revolves the work under the wheels, while in the other new work is being placed.

work in which the wheels operate at diametrically opposite points; but it is adapted to operate equally well upon flat surfaces generally.

**Alloys of Chrome and Iron.**

One of the papers submitted at the International Congress of Mining and Metallurgy was that of A. Brustlein, of the famous firm of Jacob Holtzer & Co., Unieux, France, whose exhibit at Paris attracted very considerable attention. It is claimed for this concern that it was the first practically to manufacture chrome alloys on a large scale in Europe. In the first years of their work they manufactured them in crucibles. Later they have

*Side Elevation.***MACHINE FOR GRINDING PLANE SURFACES.**

are bevel gears with which engage similar gears on the ends of a shaft mounted on top of the frame. The right hand screw shaft is continued nearly to the bottom of the frame, and has at its lower end a bevel gear engaging with a gear on a horizontal shaft extending nearly to the front end of the frame and having its end squared for the reception of a wrench or handwheel. It is evident that by properly revolving this shaft the head-block and wheels carried by it can be raised or lowered.

Projecting from near the top of the upper part of the frame is a bracket in which is mounted a vertical shaft driven by a worm and gear, the shaft being splined to the gear and its lower end being mounted in a bracket secured to the head-block. On the lower end of the shaft is a gear, meshing with another on the lower end of a short vertical shaft mounted in the same bracket. The upper end of this shaft carries a crank disk having a crank-pin that can be adjusted toward or away from the center.

The short shafts of the tables carrying the work are mounted in vertical bearings formed upon opposite sides of the center of a bed mounted upon a hub of the frame. The bed is so formed that the water used with wet grinding is led to a reservoir in the frame. Upon the upper surfaces of the tables are clutches for holding the work. Upon the lower ends of the shafts of the tables are secured worm gears. When the bed is turned so as to bring one of the tables under the abrading wheels its worm wheel engages with a worm shaft provided with a driving pulley at its opposite end. This shaft is so mounted that its worm end may be moved so as to disengage the worm from the gear and permit the turning of the bed. Provision is made for locking the bed in place with one or the other of the tables under the wheels.

This machine is designed especially for grinding the annular bearing surfaces of valve bodies and other similar circular

made them in the blast furnace and open hearth, the grade running as high as 60 per cent. of chrome and a little beyond it. For grades even higher it is necessary to employ pure sesquioxides of chromium, and besides with this high grade the metal becomes too infusible to be manufactured in ordinary industrial apparatus. The Unieux works showed samples of the alloy containing 84 per cent. of chromium and 9 per cent. of carbon reduced without an excess of carbon from sesquioxide of chromium in a magnesia crucible. An alloy containing 82 per cent. of chromium, 7½ per cent. of carbon and 8.2 per cent. of silicon was the result of reducing the sesquioxide in a graphite crucible. A third sample carrying 80 per cent. of chromium and 11 per cent. of carbon was reduced from the sesquioxide in a brasque-lined crucible. A rich chromium-iron alloy containing 71.5 per cent. of chromium and from 20 to 25 per cent. of iron was specially made with the view of



carrying down the carbon, which was only 3.46 per cent. Other alloys manufactured in the crucible as a commercial product were ferro-chromium containing 60 per cent. of chromium and 8.6 per cent. of carbon and 50 per cent. of chromium and 8 per cent. of carbon. A special silicon chrome showed by analysis 30 per cent. of chromium, 8 per cent. of silicon and 5 per cent. of carbon. M. Brustlein quotes a number of additional analyses to prove that chrome and ferro-chrome alloys combine with greater percentages of carbon than the corresponding manganese alloys. The character of the fracture of these alloys varies more according to the percentage of carbon and silicon than it does with the grade in chromium. It thus becomes a difficult matter to estimate by sight the chromium contents of an alloy

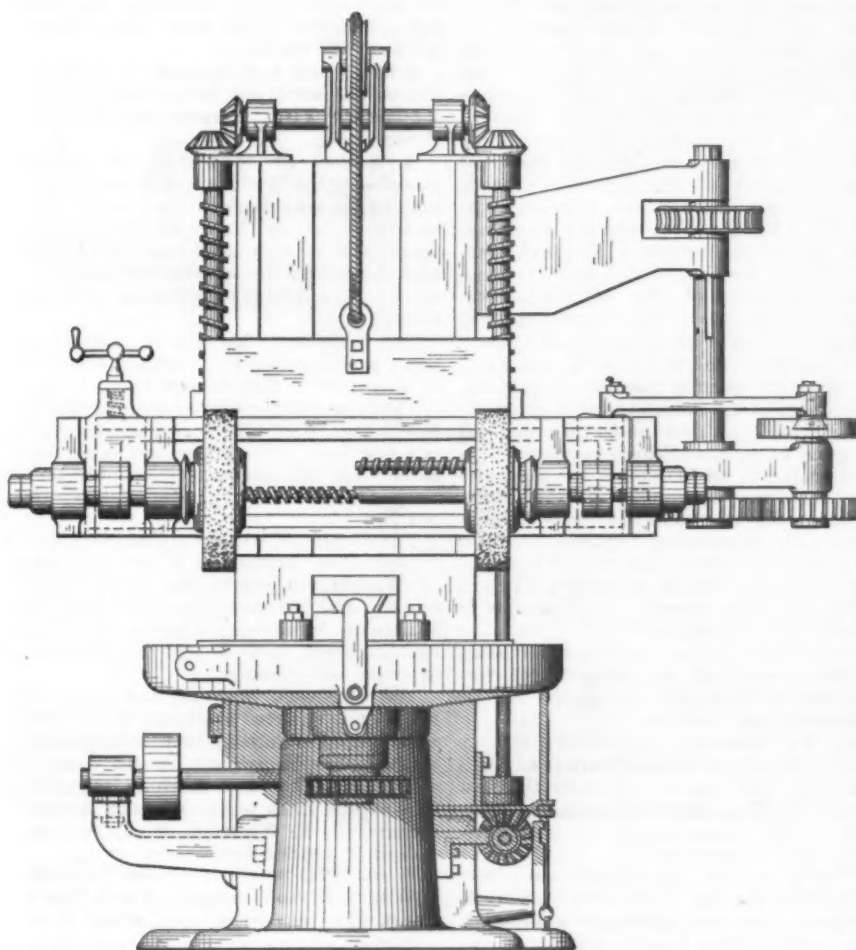
Working cold in machine tools chrome steel is always somewhat harder to work than ordinary steel, although if it is well annealed the difference is not very great. Steel containing only a small percentage of chrome can be easily worked in the lathe, even when it contains simultaneously up to 1 per cent. of carbon. When tempered in oil or in water the temper penetrates deeper than it does with the corresponding carbon steel. Chrome steels offer a resistance to shock and to rupture which has assured them the preference for certain uses.

Once obtained in the form of ingots, they can be worked like ordinary steels, but in their manufacture they present difficulties peculiarly characteristic of them. When melted or at high temperature, the chromium which they contain has a tend-

chromium rise beyond a certain limit. It will be readily understood, therefore, how pig carrying noticeable quantities of chromium yields no good results in puddling. Each grain of refined metal formed is surrounded by an adhesive skin which renders it difficult to weld. Therefore, it is impossible under the shingling hammer to unite the grains and secure a solid loupe. M. Brustlein states that he has never tried it, but is certain that any effort to puddle would fail from this cause. Since ferro-chrome alloys generally carry a considerable quantity of carbon, it would seem natural to consider their employment in the place of ferromanganese as recarbonizers of steel at the end of the Bessemer or open-hearth process. In this case allowance must be made for the drawbacks growing out of the properties to which allusion has been made.

M. Brustlein states that he considers it very difficult ever to arrive practically at the production of an extra mild steel carrying notable quantities of chromium like a steel with 0.1 to 0.2 of carbon and 1 or 2 per cent. of chromium. The production of such a steel would meet with two serious difficulties. The ferro-chrome alloys available always contain notable quantities of carbon, and the alloy rich in chromium but low in carbon would not be fusible at temperatures attainable in industrial operations, and would besides show an excessive tendency toward oxidation. In the second place, steel produced with such an alloy would be full of cinder and would be imperfect. For the same reasons chrome steels would be difficult to manufacture into armor plate and particularly into compound plates.

A conference of the firms engaged in the manufacture of structural iron and steel of all kinds was held in the office of Carnegie, Phipps & Co., Limited, at Pittsburgh on Wednesday of last week and was continued in the evening in the parlors of the Hotel Anderson. Representatives were present from the following named firms: Carnegie, Phipps & Co., Limited, Pittsburgh; Jones & Laughlins, Limited, Pittsburgh; Illinois Steel Company, Chicago; New Albany Rail Mill Company, New Albany, Ind.; Central Iron Works, Harrisburg, Pa.; Phoenix Iron Company, Phoenixville, Pa., and the Pottsville Iron and Steel Company, Pottsville, Pa. A few other concerns were also represented either in person or by letter. No action of more than ordinary importance was taken and no change was made in existing prices. The state of trade was carefully discussed, and it was the opinion of those present that the outlook for the present year was exceedingly bright as far as the structural iron trade is concerned.



Machine for Grinding Plane Surfaces.—Front Elevation.

saturated with carbon or with carbon and silicon. When they are so charged they always exhibit a tendency to a needle-like structure and they are always hard and fragile, but as the contents of these two metals diminish the hardness and fragility of the alloy decrease also.

Chrome steel differs from the chrome alloys only by the lessened proportion of constituents other than iron, so that it is natural that these substances maintain in the properties which they communicate to the steel a certain analogy with those which they give to the cast alloy. It is possible to introduce into steel very varying proportions of chrome, the effect of which is to increase the resistance of the steel without diminishing tenacity, which corresponds with its carbon contents. It even seems to slightly increase this tenacity. In forging an ingot of chrome steel it may be worked without any more precaution than is needed with ordinary steel of the same grade. It does, however, offer when heated a greater resistance to shaping.

ency to oxidize. The oxide does not, like oxide of manganese, form a fusible and liquid silicate lighter than the steel which rises to the surface. It would seem rather as though it had a tendency to form a chromite of iron. In any case, the chromium in burning produces in its immediate vicinity a decarbonization of the steel and the oxidation of the iron. This gives rise to a creamy skin, fragments which easily adhere not alone to the sides of the mold, but are held also in the mass of the metal. This effect is more noticeable as the percentage of chrome increases and as the steel itself is lower in carbon. The parts thus oxidized do not weld in any subsequent operation, whatever may be the temperature to which the steel is heated. For the same reason the layer of oxide which forms in heating ingots or bars is thicker and more adhesive than it is in the case of ordinary steel and does not well dissolve in borax. The result is that chrome steels weld with difficulty or do not weld at all as soon as the contents of

The Louisville and Nashville Railroad has made the following rates on pig iron to Atchison, Cherryvale, Columbus, Galena, Gerard and Joplin, Kansas, and to Council Bluffs, Iowa, and Joplin, Mo., from—

Ætna, Tenn.....	\$5.00
Goodrich, Tenn.....	4.94
Warner, Tenn.....	4.84
Cowan, Tenn.....	5.04
South Pittsburg, Tenn.....	5.30
Chattanooga.....	5.44
Birmingham district.....	5.44
Sheffield, Ala.....	4.99
Stribling, Tenn.....	4.04
Nashville.....	4.54
Cedartown, Ga.....	5.94

A number of manufacturing firms of Pittsburgh have sent a special commissioner in quest of trade to South America. The firms are Park, Brother & Co., Limited, of the Black Diamond Steel Works; the Oliver & Roberts Wire Company, Limited, the National Tube Works Company, George Macbeth & Co., James Callery & Co. and the Hostetter Coke Company.

## VIRGINIA IRON NOTES.

If all the new undertakings that come semi-confidentially to your correspondent's ears reach an ultimate materialization Alabama will have to look to her laurels as the foremost manufacturing State of the South. The invasion of Northern, Western and foreign capital in Virginia is creating a metamorphosis that will in time be the industrial marvel of the century. The tremendous State debt that has for so many years hung like a millstone about Virginia's neck has long ago ceased to be the bugaboo it originally was in scaring off new investments in mining lands, mills and factories. Virginians have stopped bemoaning the existence of this colossal obligation, and have gone to work with a will to develop the wealth-producing and debt-banishing elements that lie in such inexhaustible quantity within these hills and valleys.

The mineral lands of the State are being bought up or optionized rapidly, and as a consequence they are becoming gradually scarcer and more valuable. That they are enhancing in valuation is indicated by the proposition which comes from the General Assembly, in the form of a resolution providing for the appointment by the Governor of a commission to "investigate the quality, quantity and condition of Virginia mineral properties and coal deposits and compare the assessment with the assessment of same quality in other States or countries," with a view of the adoption of legislation looking to the proper assessment of mineral lands in this State. This is simply one of the many tell-tale straws that point toward the coming iron and coal renaissance in Virginia.

A bill has been introduced in the Legislature incorporating or rather changing the corporate name of the Richmond Locomotive and Machine Works Company to the Richmond Equipment and Security Company. The minimum capital stock is to be \$200,000 and this may be increased to an amount not exceeding \$3,000,000. This company as they now exist are working 550 hands and the passage of this bill will cause an extensive enlargement of the capacity of the works and the employment of several hundred additional operatives. It will put the Richmond plant on the same footing with other large establishments of the kind in other parts of the country, and will enable it to successfully compete with them in executing large contracts.

Under the new organization there will be two distinct and separate departments: one manufacturing and the other, strictly speaking, financial—a security branch, in fact. Heretofore it has been the practice of railroads to purchase their equipment supplies for cash; there have, of course, been exceptions, but this has been the rule. It has often been the case, however, that they did not have the cash with which to purchase and rather than issue and negotiate bonds they would be operated without adequate equipments.

One of the chief objects sought in the charter prayed for is to meet just such cases. The locomotive works will be enabled to take and find markets for bonds instead of demanding the cash. In this manner the facilities of the company for obtaining work and competing with other companies will be greatly amplified. Railroad companies and others can be approached with this added advantage to themselves and their patronage thus secured by the establishment of a market for their bonds without trouble or expense to themselves.

Under the present charter of the company this inducement cannot be offered. Recognizing the fact that there is plenty

of railroad mileage, but an insufficiency of railroad equipments, the new company wish to put themselves in the position to meet the large demand for equipments that they see is sure to be made in the next ten years, as there is not a railroad in the South which is supplied to the extent of its needs in locomotives and other rolling stock.

The Legislature is busy with numerous other new enterprises and during the past week bills have been introduced to incorporate the following new companies: the Eureka Iron Company, the Virginia Princess Coal, Iron and Steel Company, the Albermarle Mining and Mfg. and Railway Company, the Mt. Tony Mining and Transportation Company, the Peale Creek Coal and Iron Company, of Winchester, the Staley's Creek Manganese and Iron Company, the Glasgow Manganese and Mineral Company, the Tacoma Mining and Transportation Company, the Newmarket Iron Improvement Company, the Brookmead Mining and Improvement Company, the Shenandoah Mining and Land Improvement Company of Milnes, the Radford Land and Iron Company, the Clinch River Mineral Company, the Midland Steel and Iron Company of Midland, the Virginia Railway, the Radford Iron Company, the Cardwell Machine Company, and to change the name of the Kentucky, Virginia, Tennessee and Carolina Mining and Development Company to the Moccasin Gap Land Company. A charter has also been asked for the Washington Zinc Company of Lynchburg, and to ratify the charter of an amended charter therefor granted by the Judge of the Circuit Court of Roanoke County, and acts done under the same, and to grant to them additional powers.

Roanoke is by long odds the most active industrial community in this State. It is in reality the nucleus around which has formed the stimulating influence that has produced the greater part of the developing tendencies which at present exist in Virginia. The growth of Roanoke is steady and substantial, and a score or more of really pretentious plants are being quietly negotiated, and about which further and more explicit particulars will be furnished your readers.

C. W. Montague, representing a large steel company, with headquarters at Philadelphia, has been in Roanoke the past week trying to effect arrangements looking to the establishment of a branch steel plant in Roanoke.

Nearly all the foundations have been completed for the West End Furnace at Roanoke, the iron casthouse is finished, and work is being rapidly pushed on the stoves and stack. The Rover Iron Mines will very probably furnish this plant with most of its ore, and a narrow-gauge railroad will be constructed to increase the facilities for handling both the raw material and the manufactured product.

Subscription-books to the capital stock of a company to establish a file manufactory in Roanoke have been opened, and the stock at this writing has been taken rapidly. The capital is to be \$25,000.

Parties in the same city have plans on foot for the organization of a nail works, the details of which will be sent you later.

J. E. Mulcare & Co., recently burned out at Rocky Mount, Va., have gone to Roanoke and have begun on an extensive scale the manufacture of tinware and galvanized iron cornices.

The business of the Rife Hydraulic Engine Company, of Roanoke, has grown so rapidly that the company contemplate the erection of a large plant at an early day. This concern shipped four of their engines to parties in Florida one day last week.

The American Bridge Company, of Roanoke, are full of overdue work, and are constantly adding to their force. They shipped during the past few days several

iron bridges to various points in Southwest Virginia.

Moneyed men of the same city are beginning to watch numerous outside investments, and as an outgrowth of this tendency the Roanoke and Pulaski Mineral Company, organized at the latter city last week, are said to be one of the strongest companies ever organized in this State with exclusive Virginia capital. George W. Palmer, of Saltville, is president, and the company intend to erect three iron furnaces at Pulaski City as soon as the necessary arrangements as to material can be perfected.

The Longdale Iron Company, of Alleghany County have begun operations on the Big Hill iron mines, near Gala station in Botetourt County. The ore found there is pronounced to be of a very superior quality. Forty men were put to work a few days ago erecting buildings, &c., and 300 miners will be at work there within the next few weeks.

A trestle and a stockhouse of capacious dimensions have just been completed for the Buena Vista Furnace Company, at Buena Vista.

A carload of sheet iron and piping passed over the Norfolk and Western Railroad the present week *en route* to the Graham furnaces in Tazewell County. A trestle and a large stockhouse have just been contracted for by these furnaces. A. W. Grove, a Roanoke contractor, gets the work.

The same party has also a contract to build a stockhouse for a furnace which is to be erected at Max Meadows.

The lessees of the iron mines near Rocky Mount will begin mining and shipping ore in a few days. The engine and other machinery for this purpose arrived the past week and are rapidly being placed into position.

The Blankman Gunsight Company were organized at Alexandria a few days ago by Washington capitalists. The capital stock is \$50,000 and the officers John L. Blankman, president; Charles W. King, vice-president, and George E. Emmons, secretary and treasurer.

The Cardwell Machine Company, of Richmond, reported elsewhere in this correspondence as having been incorporated by the State Legislature, intend doing a general foundry and machine business. The capital stock is \$85,000, and Samuel Freedly, C. E. Whitlock, W. J. Johnson and others are the corporators.

W. A. Rife, president of the Roanoke Hydraulic Engine Company, was in Washington the past week, and while there perfected arrangements for establishing works for the manufacture of his patent ram.

J. F. Slaughter, of Lynchburg, and Mr. Kountze, of New York City, have purchased a tract of mineral land in Wythe County, paying therefor the sum of \$35,000.

The West Iron Gate Improvement Company have organized at Staunton with a capital stock of \$100,000. Gov. James E. Campbell, of Ohio, is president; William T. McCue, of Staunton, vice-president and general manager; O. Hillman, secretary and treasurer.

At a meeting of the City Council of Manchester, held a few evenings ago, a resolution was passed recommending that that body grant in perpetuity to the firm of Johnson & Co., manufacturers of car axles, Richmond, 2½ acres of land belonging to the city as a site for their establishment. The resolution was referred to a committee who are understood to be favorable to the proposed donation.

Two new companies have been organized at Newcastle, to develop iron properties near that place, where the ore is said to be of a very fine quality.

The New York capitalists and others of the Atlantic and Danville railroad syndi-



cate who have recently bought large tracts of mineral lands in Southwest Virginia have organized three companies with a combined capital stock of \$3,000,000, and will build towns, and establish several important industries, including iron works and car shops.

The Willis Mountain mineral region is to be developed, and the Whisposing Company have been organized to engage in mining and build and operate furnaces.

The name of Pennsylvania's great iron manufacturer is to be perpetuated in Virginia by the organization of the Pittsburgh Development Company, which con-

R. Williams and others. A mining and manufacturing business will be engaged in.

The machine shops of the Shenandoah Valley Railroad, located at Milnes, are to be enlarged. A boiler shop will also be built.

The Coal Mountain Mining Company and the Round Mountain Mining Company already mentioned as applying for charters have chosen officers as follows: For the Coal Mountain Company, J. S. Morehead, Leaksville, N. C., president, and G. W. Gillespie, of Tazewell County, Va., secretary and treasurer; for the Round Mountain Company, J. D. Blair, of Danville, president, and W. E. Turner, of Rich-

The Glamorgan Company, of Lynchburg, Va., have been awarded the contract for the pipe and iron work for the new Congressional Library building at Washington City.

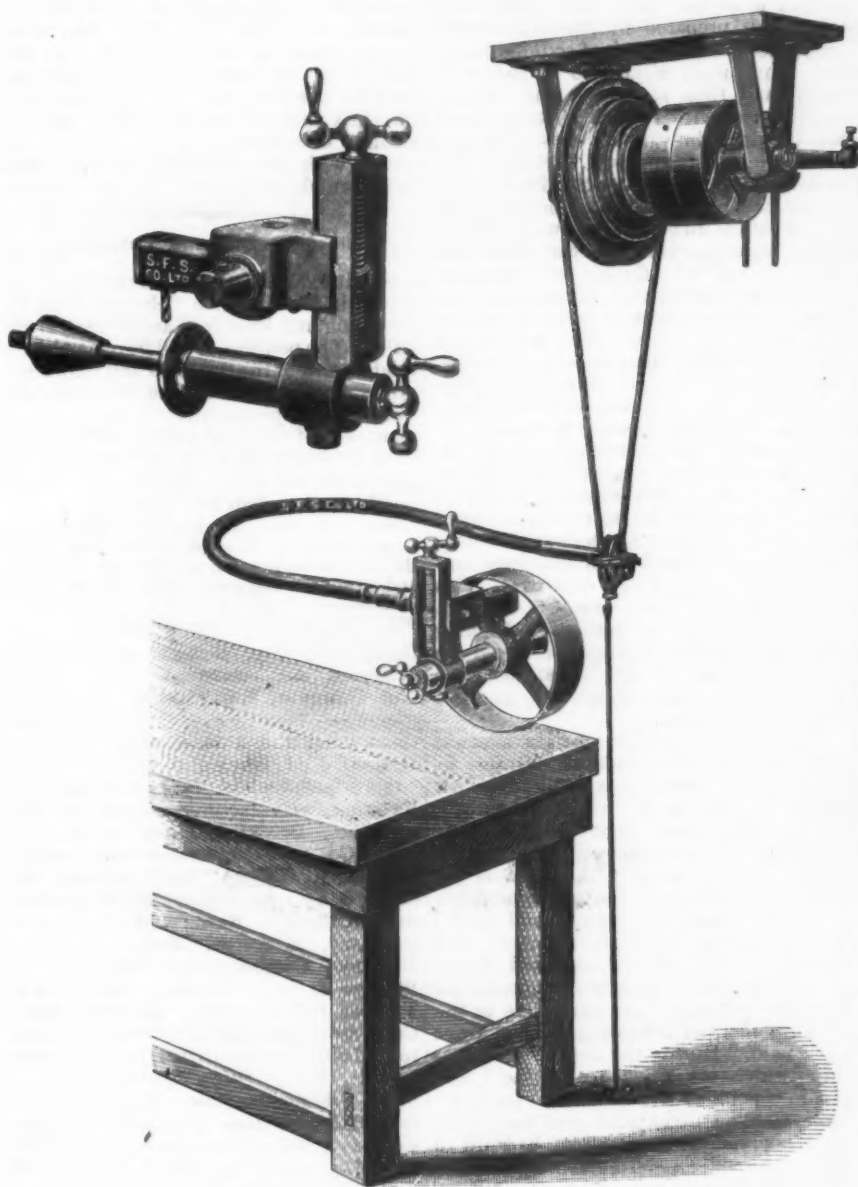
#### Drilling and Tapping Machine.

The large accompanying cut shows this machine set up ready to drill the hub of a small pulley, with the flexible shaft connected and the counter shaft and belt in position. The machine, shown detached and enlarged in the smaller view, has a spindle or arbor on which the pulley is placed and held by a taper cone and nut. It has a screw feed motion in line with the axis of the hub, thereby allowing the starting of the drill in any part of the hub. The drill is fed by a screw feed motion. By loosening a set screw on the side of the machine the latter feed motion is detached and the tap can be fed in by hand with a handle applied in place of the flexible shaft. The machine is designed to drill and tap the hole in hub for set screw, without drilling any hole through the rim and can be used on pulleys 6 inches diameter and upward. The machine is thoroughly portable, weighing only 18 pounds. It is made by the Stow Flexible Shaft Company (Limited), of Philadelphia, Pa.

The Hartman Steel Company, of Pennsylvania, has brought suit, at Topeka, Kan., in the United States Circuit Court, against the Southwestern Barbed Wire Company and the Consolidated Barbed Wire Company, both of Lawrence, Kan., and A. D. Mackey, J. D. Bowersock, Mrs. Caroline M. French and W. F. French, of Lawrence, to enforce the payment of a judgment of \$10,000, obtained in 1884 against the Southwestern Barbed Wire Company. There were several companies at Lawrence dealing in barbed wire, which were consolidated under the name of the Consolidated Barbed Wire Company. The stockholders of the original company were stockholders in the new organization, but refused to pay the above judgment. The complainant declares that wire purchased by one company was switched in car-load lots to another company's works and used. They are now endeavoring to induce some one at Lawrence to pay them for the wire.

The corrosion of iron and steel variously combined forms an interesting subject of investigation by Prof. Thomas Andrews, of Wortley Iron Works, Sheffield, England, who has been carrying out a series of experiments on the corrosion of irons and steels when immersed in sea water. Mr. Andrews has divided the possible causes of corrosion under three heads: First, the effect of the chemical influence of the saline constituents of the sea water upon the single plates of various metals aided by the action of carbonic acid gas or other gases; second, such simple action may be greatly accelerated where there are bars or plates of dissimilar metals, such as wrought iron, steels, cast metals, connected together under equal conditions of circuit, and immersed in sea water, the metals thus becoming galvanic elements after the manner of the voltaic cell, and thirdly, the electro-disintegration of the metals when long exposed in sea-water. As regards the total results, the lower the percentage of combined carbon the less is the corrosion, the best scrap iron corroding for the whole period much less than the steels for the same time.

The Ottawa Government has ordered that tolls on grain passing through the Welland and St. Lawrence canals shall remain the same as last year—namely 2 cents per ton.



PULLEY-HUB DRILLING AND TAPPING MACHINE.

cern will build a new town to be called Carnegie City. George B. McLane, of Roanoke, is president, D. J. Turner is the vice-president and J. B. Levy is the secretary and treasurer.

The New River Mineral Company, of Ivanhoe Furnace, are preparing to erect an engine at their mines.

The mineral lands of Floyd County are attracting notice and thousands of acres have within the past few days been optionized. R. M. Brown, of Pulaski City, has purchased 1100 acres paying, it is said, \$10,000.

Parties at Stuart are to erect a foundry and machine shop.

The Virginia Land and Commercial Company has been organized at Richmond by T. W. Pemberton, M. M. Gilliam, J.

mond, secretary and treasurer. The paid-up capital of the two companies is \$1,250,000.

The Iron Gate Company has been formed at Iron Gate. J. P. Houck is president, John G. Youcey is vice-president, T. A. Long is secretary.

There is considerable activity at the new town of Iron Gate. Boiler works, machine shops and other industrial plants are to be established.

At Danville an Ohio machine works plant is to be located and capitalists from New Jersey are prospecting with the view of establishing a \$1,000,000 plant, the nature of which has not yet transpired.

The car shops of the Atlantic and Danville Railroad are to be removed from Belfield to Claremont.

### Iron Speculation in England.

The Barrow correspondent of the *London Engineer* writes as follows in a recent issue of that journal:

As the depression is the result of speculative influences, it is evident that sooner or later the "bears" will tire of their present tactics, especially as makers of pig iron have not in any sense changed their tone during the past month, although in the meantime they have not sold much iron, nor, indeed, have they tried to sell much. Makers are in a most peculiar position. On the one hand, they have holders of warrants who are selling iron at fully 15/ per ton below the cost of production, and on the other hand they have not only dear iron ore, but dear coke, and the supply of both is scarce and somewhat precarious. Either from one source or another makers must get relief. Prices of warrants must either improve or the cost of raw material must be sensibly reduced. Then there is again the difficult question of labor. Mine owners and coke burners are both paying advanced wages to their workmen, and the latter are urging for a still further increase in their earnings. Until the labor question is on a more satisfactory footing the price of raw material cannot be lowered, and there is also a difficulty in securing lower prices in face of the fact that the demand for both iron ore and coke is greater than the supply. The other ingredient in blast furnace operations is limestone, and the men engaged in quarrying this material for blast furnace use are asking for increased wages. All the features of the present position seem to point but to one conclusion. The operations in the speculative market are on false lines, and a return to better prices must therefore be effected sooner or later, or such a crisis will ensue in the trade as has never been experienced. It is true that stocks have been increasing, and that "bears" on these lines are justified in depressing the market, but it is also true that many firm holders who can wait are getting hold of stocks with a view to a rise, and it is further true that the uncertainty of the immediate future of the trade is such as to induce weak and timid holders of stock to clear out before prices get still lower.

With an intimate and practical knowledge of the trade, extending over a period of 30 years, I have never known such a remarkable position of things as that which now exists. It all comes of the fact that makers some time ago allowed their stocks to get too high, hoping for a rise in prices which was not realized. Then speculators came into the market and fixed up hematites as negotiable warrants. The result is that warrant holders who have 400,000 tons of stock at their command are in a position, to a very large extent, to dictate to makers what their quotations will be from day to day, and this in spite of the question of cost of production or any other natural law. Fortunately for makers, they are able to hold their own with speculators at present, as they are so well sold forward at prices than are now ruling and can afford to wait for some months to come without selling another ton of iron. But this does not get over the fact that to a great extent speculators are nowadays enabled to pick up the lion's share of the profits made by the trade, while makers are to a marked extent mere shuttlecocks at the caprice of what are, practically speaking, gamblers in iron.

The possessions which France now claims in Africa extend unbrokenly from the Senegal River to the Ivory Coast on the Gulf of Guinea, including a vast area lying behind the British territories of Gambia and Sierra Leone and the republic of Liberia.

### Electrolytic White Lead.

The following is described in the *Electrical World* as a process for the electrolytic production of white lead, recently patented and put in practical operation by Mr. Turner D. Bottome, of Hoosick, N. Y.

The process devised by Mr. Bottome consists in electrolytically dissolving a lead electrode in an electrolyte containing nascent of free carbon dioxide, whereby the lead compound formed by electrolytic action is precipitated to form hydrated carbonate of lead, or pure white lead, which is then removed, washed and dried.

The manner in which this is accomplished is as follows: The electrolytic solution is prepared by dissolving in the proportion  $\frac{1}{2}$  pound each of sodium nitrate and ammonium nitrate to 1 gallon of water, and then saturating the solution thus formed with carbon dioxide, which can be done in various ways. Sodium carbonate and ammonium carbonate may be used in the place of the nitrates; but in that case nitric acid must be added until the bath is about neutral, which results in the larger portion of the carbon dioxide being driven off during effervescence. The electrolytic solution is then placed in a tank and electrodes of metallic lead are immersed in the same. The electrodes are then connected to the generating dynamo, and a current density of about 15 amperes per square foot of anode surface is maintained. Upon the passage of such a current between the electrodes through the bath the white lead begins to fall rapidly. As the carbon dioxide is taken up from the bath to form the hydrated carbonate of lead, it is, of course, necessary to have the bath replenished with additional carbon dioxide as the process continues. This can be done in several ways. A convenient way of doing this consists in burning limestone, washing the gas produced by the dissociation of the constituents of the limestone, and supplying the gas directly to the bath.

Where the electrolytic solution is made up of sodium and ammonium nitrates in water, and the solution is saturated with carbon dioxide in its free state, the reactions taking place upon the passage of the electric current, according to the inventor, are as follows: The bath is decomposed, yielding at the anode nitrogen pentoxide, ozone and oxygen, and at the cathode sodium hydrate, ammonia and hydrogen. The lead is attacked by the powerfully oxidizing nitrogen pentoxide and ozone; but nitrogen pentoxide in the presence of water is decomposed and forms nitric acid. During the double decomposition which takes place nitric acid and plumbic acid, or hydroxide of lead, are formed. The nitric acid combines with the free ammonia and sodium hydrate to again form sodium and ammonium nitrate, while the plumbic acid is precipitated by the free carbon dioxide present and forms finally the hydrated carbonate of lead. Thus it is seen that although the solution is decomposed by electrolysis, it is regenerated by the chemical reactions taking place, and the only loss sustained is carbon dioxide and water, which can be readily supplied.

The white lead is from time to time removed from the tank, washed and dried, and on mixing with a suitable vehicle into a paint it is found to have much greater covering properties than ordinary commercial white lead formed by dissolving lead in acetic acid in the presence of carbonic acid, since the latter is slightly crystalline and less opaque than the hydrated carbonate produced by the action of carbonic acid on plumbic. Lead is dissolved at the rate of 59.52 grains per ampere hour, and if the dissolved lead is caused to combine with some element before deposition takes place it will add to its own weight that of the element. Thus lead in com-

binning with water and carbon dioxide gains 19.88 per cent., or nearly 30 per cent. Hence one ampere hour forms 71.35 grains of pure white lead. The counter electromotive force of the white lead bath is from  $\frac{2}{3}$  to  $\frac{1}{2}$  volt, so that the  $\frac{1}{2}$  volt is required to operate one tank; one watt hour will then deposit or form 148.7 grains of white lead, or 15.2 pounds, per horse-power hour, or 152 pounds a day per horse-power, or 27 $\frac{1}{2}$  tons per year. Figuring power at \$55 a year, 50 cents a ton for the electric current would cover the making of white lead. The cost of the water entering in combination is nil, and that of the carbon dioxide also, because 575 pounds of lime rock evolve 230 pounds of the gas at a cost of 100 pounds of hard coal, leaving a by-product of 345 pounds of quicklime, which more than pays for the coal, while the 230 pounds of gas just make 1 ton of white lead, 170 pounds of water also entering into combination with 1600 pounds of lead to form 2000 pounds, or 1 ton.

### The New England Petition.

Additional signatures have been received in Boston since February 11 to the New England Free Iron and Free Coal Petition. The petition, it will be remembered, is addressed to the Senators and Representatives in Congress of the New England States by representative proprietors or managers of iron-working establishments in those States, who request that these two provisions be incorporated in any revised tariff law that shall be enacted.

First, That iron ore and coal and coke shall be put upon the free list, as they were before the war; secondly, that the duty upon pig iron and scrap iron and scrap steel which prevailed immediately before the war be restored, to wit, a duty of 24 per cent. ad valorem.

George H. Day, manufacturing sewing machines, &c., Hartford, Conn.; Aetna Nut Company, Southington, Conn.; Birmingham Iron Foundry, Birmingham, Conn.; Smith & Anthony Stove Company, Boston; J. H. Houghton, manufacturer of engines and boilers, Boston; William A. Sweetzer, manufacturer of tack and nail machines, Brockton, Mass.; S. K. Lovewell & Co., manufacturers of wood-working machinery, Chelsea, Mass.; Ewing Brothers & Co., manufacturers of printing presses, Chelsea, Mass.; Old Colony Rivet Company, Kingston, Mass.; Rawson & Morrison, Cambridgeport, Mass.; E. W. Strange & Co., Taunton, Mass.; O. G. Thomas Stove Works, Taunton, Mass.; Cobb Stove and Machine Company, Taunton, Mass.; Joseph Turner, machine shop, Lowell, Mass.; Howe Spring Bed Company, Bridgeport, Mass.; B. F. Perkins & Son, Holyoke, Mass.; Franklin Spring Bed Company, Worcester, Mass.; the Ambler Saw Mfg. Company, Natick, Mass.; John R. Loring, machine shop, Andover, Mass.; Bemis & Call Hardware and Tool Company, Springfield, Mass.; Plymouth Foundry Company, Plymouth, Mass.; W. M. Richardson, hardware, Waltham, Mass.; George F. Burnap, force-pump manufacturer, Fitchburg, Mass.; George Gerry & Son, Athol, Mass.; Boston Bridge Works, Boston; Lina Goodell, machine shop, Salem, Mass.; Osgood, Bradley & Sons, car manufacturers, Worcester, Mass.; Porter & Co., Watertown, Mass.; Porter Shuttle and Bobbin Company, Watertown, Mass.; Alvin Streeter, Winchendon, Mass.; E. O. Knight, Worcester, Mass.; C. F. Richardson, Athol, Mass.; Heywood Foundry Company, Gardner, Mass.; The H. B. Smith Company, Westfield, Mass.; George C. Taft, manufacturer of hand drills, Worcester, Mass.; Nichols Brothers, manufacturers of cutlery, Barnardston, Mass.; William Allen & Sons, Worcester, Mass.; Gilbert Loom Company, Worcester, Mass.; H. S. Russell, boiler manufacturer, Pittsfield, Mass.; McGregor & Sons, Fall River,



Mass.; Ezra Sawyer, Worcester, Mass.; Boynton & Plummer, Worcester, Mass.; Junction Foundry Company, Worcester, Mass.; H. C. Earle, machine shop, Worcester, Mass.; Paul B. Batten, Salem, Mass.; Albert H. Patten, machine shop, Salem, Mass.; Rood & Vaughn, Salem, Mass.

In accordance with the foregoing Mr. Hale presented in the Senate on Friday a petition from New England iron and steel manufacturers, asking that iron, coal and coke be put upon the free list, and that the duty on scrap iron, scrap steel, &c., be reduced to 24 per cent. ad valorem.

### Forge and Blower.

The accompanying engravings show a lever forge and a lever blacksmith blower made by the Champion Blower and Forge Company, of Lancaster, Pa. The dimensions of the hearth of the forge are 30 x 44 inches, not including the water tank. The coal box, the design of which was borrowed from our great grandfathers, has a sloping bottom extending below the

and to avoid any slackening up between strokes. The fan is made on the principle taken from the Champion Company's steel pressure blowers run by power. This blower is noiseless when in operation, and is claimed to produce a blast fully double that of any blower or bellows, while it is as regular as that obtained by a blower run by power.

### A Naval Board on Electric Welding.

A board of officers of the United States Navy, consisting of Commander George A. Converse, A. S. Greene, Assistant Naval Constructor S. A. Armistead and Ensign Gilbert Wilkes investigated the Thomson electric welding process. We quote from it the following:

We are convinced that the Thomson welding process can be found of great utility to the naval service, both on shore and afloat, for the following reasons.

It can be used—

- (a) In welding breaks in rods without altering them either in length or shape.
- (b) For welding tubes.

have heretofore been considered impossible.

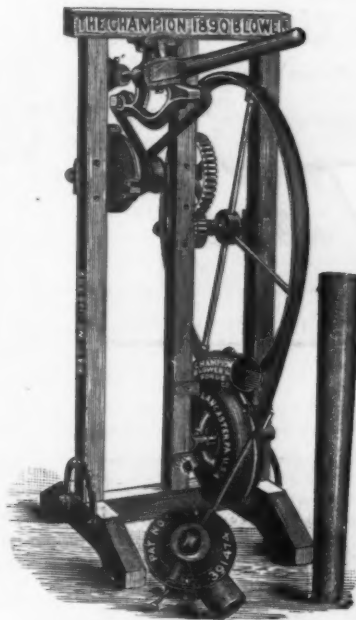
It is the unanimous opinion of the board that in the present day of ships constructed almost entirely of metals, and in which every fitting possible is made of metal, such a system as that which has been investigated by us becomes not only desirable, but a means to economy of expense, time and labor, and would add to the efficiency of the vessel under any condition of service.

This system of welding occupies a position of its own; it is able to do not only a large part of the work of the forge now in use, but is capable of doing much work that was hitherto considered impossible. By its use the large accumulation of now almost worthless boiler tubes stored at the navy-yards could be made fit for service; and the quantity of spare tubes and of many other stores now carried by ships could be reduced.

As the classes of work at naval stations and on shipboard differ materially, the welders designed for use in the two places should be constructed for the work that will be required of them; those for use on



LEVER FORGE.



BLACKSMITH'S BLOWER.

level of the hearth and has a capacity of  $\frac{1}{2}$  bushel of coal. The principle of its construction enables the coal to be kept in a sufficiently wet condition to obtain the most satisfactory results, at the same time guarding against water coming in contact with the fire. The convenience and economy that result from keeping the coal properly moistened while making large heats will be readily appreciated. Connected with the forge is a steel pressure blower, equipped with a 14-inch fan and a 24-inch driving-wheel, the blower being situated so as to discharge the blast directly into the fire, thus securing the most satisfactory results with the least expenditure of time and labor. The total weight of the forge with the water tank attachment is 360 pounds.

The power for the blower is furnished by the Champion lever motion, the shaft being connected with a large cog-wheel, geared with a smaller one, giving the driving-wheel of 30 inches diameter a momentum of two revolutions to one downward stroke of the lever, an advantageous feature which, it is claimed, is not possessed by any other make.

The fly-wheel has a cast iron rim, with wrought iron spokes and cast iron hub, the rim being heavy and the spokes light, to give more momentum and regularity

- (c) For welding angles and shapes of intricate form.
- (d) For welding copper, brass, cast iron or other metals.
- (e) For heating metals for forging, tempering and upsetting.
- (f) For welding wire cables.

Under these heads the following may be mentioned as a few of the many applications that would result on shipboard: For welding broken pump piston-rods, valve stems, &c.; for joining wires of iron, copper or other metals or bars of the same, of similar or different shapes or sections; for making joints at angles with bars (T or Y joints); for mending chain and wire rope; for constructing or joining, end to end, pipe of all kinds, and of large or small diameter; working or joining lead pipe; welding T-connections or elbows into lines of piping; welding safe ends to boiler tubes; repairing boiler tubes; welding eye-rings, and welding these again to bolts or bars; repairing cutting and boring tools without hurting their temper; lengthening or shortening rods or bars; repairing broken cast-iron pieces of machinery or broken cast-iron or cast-brass fittings; welding copper electric mains.

This system of welding thus renders easy many operations in the working of metals which with the forge and smith

board ship being especially designed with a view to lightness, compactness and adaptability to general work.

Prof. C. W. MacCord, of Stevens Institute, speaking of Captain Ericsson's early life, says that Ericsson exhibited mechanical tastes in his boyhood; and that when only nine years of age he learned the use of drawing instruments by observation. He made for himself compasses of birchwood, with needles in the ends of the legs, and converting a pair of tweezers into a ruling pen, he drew in detail the plans for a windmill and a pumping engine of his own devising. These drawings were colored with brushes which he made of hairs purloined from his mother's sable cloak. Finally he built and set up the small machines themselves. The flame engine alluded to was the precursor of the later Ericsson calorific engine.

The Pencoyd Iron Works, of Philadelphia, are just finishing an iron bridge at Manayunk to enable the different mill owners to send out and receive freight by cars instead of canal-boats. The bridge is curved like the letter S and has six spans, four of which are over the Schuylkill.

### Mechanical Movements.

The several mechanical movements, of which drawings are presented, are intended to serve as roller-bearings for gyrating parts. In the use of double-cone rollers of this description, as a support for a part to be gyrated where a high velocity is given, there is a tendency upon the part of each roller to leave its lower or supporting bearing, and a like tendency for the upper bearing with the load carried by it to be thrown off the roller in consequence of centrifugal force. In order to insure the engagement of the roller and its bearings and render any desired speed practicable, the roller in Figs. 1 and 2 is provided with a centrally-located circumferential enlargement, which, upon each of its upper and lower sides, has a V-shape in cross section so as to form a bearing face having oppositely-inclined surfaces. The bearings are circular, and within the face of each is formed an annular groove, in which fits the enlarged edge of the roller. This construction effectually locks the parts in relative radial position and prevents accidental displacement. If desired,

arranged boss having either a spherical or conical form. In the center of each bearing plate, the surfaces of which are parallel, is a spherically-shaped recess to receive the boss of corresponding form or a cylindrical recess to receive the conical boss. These bosses operate as guides to hold the roller in position. As they are subjected to a considerable amount of strain, they are liable to become worn or broken before the body of the roll shows any defect from use. To obviate this the bosses are formed upon the ends of a steel mandrel extending through the roller. The bearings have usually been secured to the

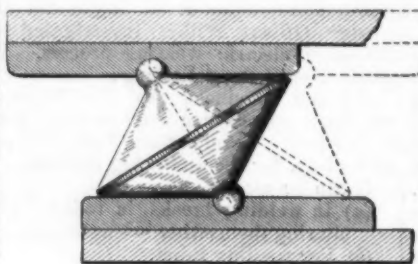


Fig. 7.

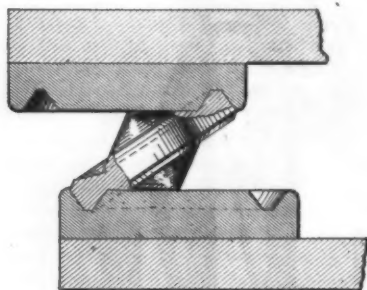


Fig. 1.

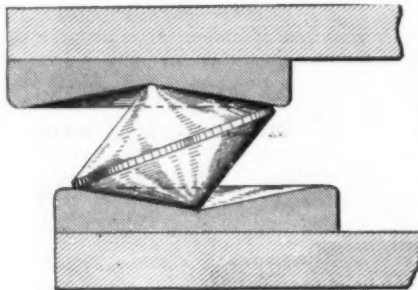


Fig. 3.

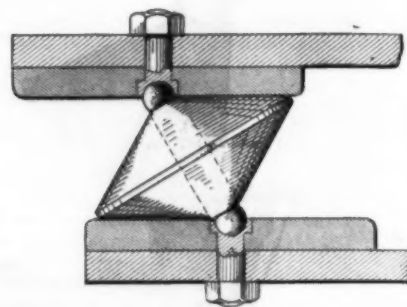


Fig. 5.

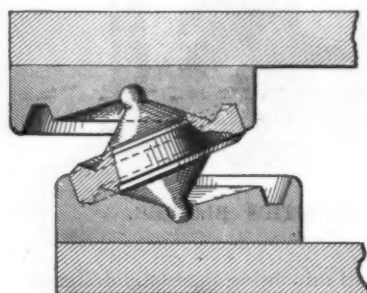


Fig. 2.

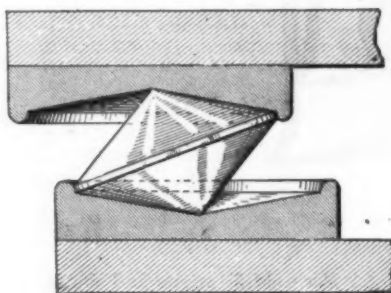


Fig. 4.

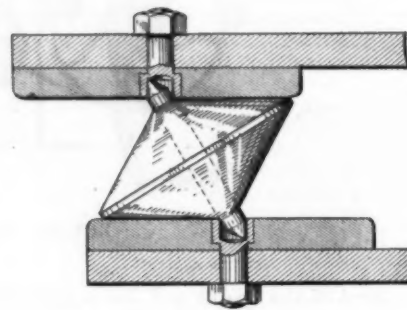


Fig. 6.

### MECHANICAL MOVEMENTS.

the strain upon the enlargement may be lessened by making the main face of the bearings conical, as shown in Fig. 2. As a further precaution the apex of each cone may be formed with spherically-shaped boss to fit in a similar recess in the bearing.

To counteract the tendency of the roller to work outward the face of each bearing, Figs. 3 and 4, is made conical so as to cause the weight upon the roller to hold it at the center of the bearing, and by varying the inclination of the surface it is possible to neutralize centrifugal action and to cause the roller to travel freely around its prescribed track without tendency to deviate. As a further guard the edge of each bearing may be formed with an annular flange having such inclination as to furnish a track for the periphery of the roller.

In the construction shown in Figs. 5 and 6 the roller is formed with an axially-

base or to the part to be gyrated by bolts passing through the parts outside of the circle traveled by the roller. In this instance the parts are held together by a bolt arranged as shown and formed with recess for the boss. The mandrel and bolts are made of steel and their engaging ends are hardened so that the friction and wear of the parts are reduced to a minimum, and great strength is secured.

The roller shown in Fig. 7 is formed at each apex with a spherical boss fitting in a suitable recess in the plate. The dotted lines show the roller when occupying its diametrically opposite position. These movements are the invention of John R. Wagner, of Luzerne, Pa., Samuel Salmon and Eckley B. Coxe, of Drifton, Pa., and have all been assigned to the latter.

The Brazilian Mint is actively working at the dies for the new gold, silver, nickel and bronze coins. The obverse of the

gold and silver coins will have a head of the republic surrounded by the words: "Re publica dos Estados Unidos do Brazil de 1889," and 21 stars representing the States and the Federal municipality. On the obverse of the gold coins the Southern cross in an ellipse; on those of silver the value, surmounted by the Southern cross and surrounded by a crown of foliage.

### A Combination of Exporters.

An attempt is making by a number of Newark manufacturers to increase their trade with Australia, South Africa, and South America, by means of a combination among themselves. A corporation called the F. B. Wheeler Company was incorporated under the laws of New Jersey in November last, having for its object the sale in foreign countries of goods of all kinds of American manufacture. F. B. Wheeler is its President, and Frederick Halstead is Treasurer. The firm of F. B. Wheeler & Co., of this city, began selling goods manufactured in America about five years ago, and built up a large trade. The business, however, in-

creased to such an extent that it was decided to form a stock company. Among the firms now interested are: N. J. Demarest & Co., harness; T. P. Howell & Co., patent leather; T. B. Petty & Co., trunks; Phineas Jones & Co., carriage wheels; H. M. Streeby & Co., carriage hardware; Butler & Ward, leather ornaments and trimmings; Sargent Manufacturing Company, saddlery hardware; the Richardson Saw Company, the New Haven Clock Company, the Cincinnati Brewing Company, and many others.

Offices have been opened in Sidney, New South Wales, and Brisbane. In the spring an office will be opened in Cape Colony, South Africa, and South American trade will be sought after next. Already the shipments amount to 300 tons of miscellaneous goods a month, and the company expects in the near future to be able to send its own vessels to the ports where its business is done.



## THE WEEK.

A large saving in the cost of heavy guns has been effected in the Washington foundry by the use of the improved plant. Eight-inch guns now cost only \$14,623, or \$3000 less than was recently paid for guns half that size.

The purchaser of the franchise for a railroad across Guatemala to the port of Santo Tomas, as noticed recently, is believed to be the Southern Pacific Railroad Company, represented by C. P. Huntington, and is believed to be the first step in a scheme for turning the trade of North and South America through that country.

The Hollins syndicate, which secured control of the Union Ferry Company by buying a majority of the stock at an exorbitant figure, already operates ferries which will give it a virtual monopoly of traffic between New York and Brooklyn.

The Alaska Seal Fisheries have been leased to the North American Commercial Company, of New York and San Francisco, J. Liebes is president. The Government will secure about \$1,000,000 per year, instead of \$300,000 as heretofore.

Deputy Collector Charles P. McClelland resigned his position in the New York Custom House.

Five supervisors and the superintending architect, R. B. Eastman, were indicted by the Grand Jury of Kings County for fraudulent practices.

Pittsburgh, like many other cities, is giving attention to rapid transit. What is called the Duquesne Traction Company's road, with ten branch lines extending to the city in every part, has been sanctioned by the Councils, with C. L. Magee, president. Very soon the work of construction will commence and the expenditure is estimated at \$3,000,000.

Real estate in Philadelphia changed hands last month to the extent of \$6,500,000, principally in the suburbs.

Anti-trust legislation is popular in Congress as well as in the State legislatures. There are to-day in the committees of the House and Senate 19 bills proposing legislation for the suppression of all kinds of trusts and combinations. Of the House bills seven are before the Ways and Means Committee, six are in the Judiciary Committee, in addition to Mr. Enloe's proposed amendment to the Constitution and two in the Committee on Manufactures. There is one bill before the Finance Committee in the Senate, one in the Judiciary Committee, and one is under discussion in the Senate, the latter Mr. Sherman's, which it is his intention to press. Correspondents at Washington understand that the McKinley tariff bill will probably have an anti-trust clause attached, designed to be a substitute for all others referred to above.

A Florida paper in making an estimate of the next crop of oranges in that State says: "If we estimate the next crop of oranges at 3,000,000 boxes it will require 10,000 carloads of 300 boxes to the car to move the crop, and calculating the average freight at 66 cents per box the crop pays the railroads \$2,000,000 for freight alone.

The Grand Jury in this city which investigated the case of the bank wreckers brought in a presentment reflecting severely on President Leland, of the Sixth National, condemning his action in "selling out at an enormous profit by negotiations conducted in a secret manner and in a most unbusinesslike and unusual way its controlling interest therein to parties as to whose financial standing or

business respectability he had no sufficient knowledge." Not less censurable, in the opinion of the Grand Jury, are the officers of the two minor banks that were wrecked: "The boldness and recklessness with which checks for amounts in excess of the entire capital stock of the Lenox Hill and Equitable banks were certified against credits representing paltry sums of money needs no comment, unless it be the surprising truth that under the laws of this State such acts of overcertification constitute no criminal offense." The Grand Jury recommend immediate legislation to prevent reckless certification, also holding bank officers to a strict accountability.

Leaving out of view the advantages which would inure to the foreign exhibitor from having the World's Fair located on the seaboard, railroad men generally are believed to be satisfied, from a business point of view, with the choice of Chicago.

The journeymen freestone cutters of Boston have been locked out by the Contractors' Association on account of alleged "arbitrary practices."

Cincinnati proposes water service improvements to cost \$6,000,000.

The Natural Gas, Electric Lighting and Gas Light and Coke companies of Indianapolis have been consolidated by an Eastern syndicate at a capital of \$4,000,000.

The Pacific Mail Steamship Company, so far from being driven off from the Pacific Ocean by British competition, a possibility hinted at not long ago, have under serious consideration a proposition to establish a new line of steamships, to run between Tacoma and China, in connection with the Northern Pacific Railroad. The Directors have left the matter in the hands of George Gould for further negotiations with the railroad and with the city of Tacoma as to terminal facilities, docks and water frontage. It is proposed to start with two first-class steamers, and to increase the number if the business warrants. The Northern Pacific has already chartered vessels which run to and from Tacoma over the Japan route. The latest move in opposition to the scheme is a threat on the part of the Transcontinental Association to discontinue its subsidy payments to the Pacific Mail Company in case the proposed alliance is formed.

Experiments have been made in Germany with torpedoes made of paper loaded with a charge of 25 pounds of dynamite and propelled and fired by electricity. Very satisfactory results are said to have been obtained with these new torpedoes, which possess great solidity and elasticity against shock.

The Commissioner of Public Works gives notice that the repavement of the streets of this city under the \$1,000,000 appropriation will begin in earnest March 15, and that the subway people will be held responsible for any damage caused by them after this date.

It is a fact deserving of notice that New York City last year furnished nearly two-thirds of all the inmates of the State prison, and that the greatest number of any one class comes from the ranks of the laborers, the total being 827, or nearly one-quarter of the aggregate.

Like many other reported "English syndicates" heard of recently, the alleged sale of the Union Stock Yards at Chicago is pronounced mythical.

A rubber trust was formed in this city last week at the Windsor Hotel, where representatives of the Boston Rubber Shoe Company, L. Caddee Company, New Jersey Rubber Company, the Meyer Rubber Company, the Lycoming Rubber Company, the Brookhaven Rubber Shoe Com-

pany, Woonsocket Rubber Company, the American Rubber Company, the Para Rubber Company, the Colchester Rubber Company, the National Rubber Company, the Boston Rubber Company, the New Brunswick Rubber Company and also representatives of nearly all the importers of the country held a two-days' session. An advance of 10 per cent. on rubber goods of all descriptions was agreed to.

Bermuda, although a British colony, receives about one-half of her imports from the United States.

The new light on Staten Island, at Tompkinsville, is nearly finished, at a cost of \$175,000.

One of the largest rubber shoe manufacturers, it is said, has bought up all the rubber obtainable in this market, nearly 1,000,000 pounds. The manufacturers who were in session in this city last week decided to advance the prices of rubber boots and shoes 10 per cent. An advance of 15 per cent. is now contemplated.

The Chinese Viceroy has decided to establish a system of silver coinage that shall be uniform throughout the empire.

A large dome of polished copper will crown the new Jewish synagogue on Bedford and Lafayette avenues, Brooklyn.

The Pennsylvania Railroad Company have commenced their new branch to the Anthracite coal fields through Harrisburg, paralleling the Reading on a part of the route. It will feed the Schuylkill Valley branch.

A new idea for preventing the spreading of burning oil on the surface of the water in harbors consists of a floating dam built up of galvanized iron boxes. By means of this device a section of a harbor may be cut off from the rest and burning material confined where it will do the least damage.

Railroad building in China, according to the latest news from Hankow, has taken a new start, the imperial railroad commissioner having entered upon his duties with considerable vigor, and thus extensive works for the manufacture of iron and steel for the construction are about to be erected.

The bill providing for fortifications and other defenses on the Pacific Coast as approved by the Senate Committee carries an appropriation of \$123,000,000, of which \$21,500,000 shall be available in the next fiscal year.

The Dominion Parliament had under consideration the subject of imposing a duty on mining machinery imported from the United States, but postponed the final discussion.

The stockholders of the elevated roads in this city have authorized a \$40,000,000 blanket mortgage, to secure a new issue of bonds, and a portion of the proceeds will be available for extensive proposed improvements.

Baltimore imported in February 69,000 tons of iron ore and 78,000 boxes of tin plate.

Contemplated changes in the Canadian tariff, so it is stated on "good authority," whatever that may mean, include higher duties on iron and steel.

The spring sales of real estate in New York are acquiring much importance. Activity is most noticeable on the west side in the uptown districts.

The Lehigh Valley Railroad Company expect to have a terminus with their own tracks both in Philadelphia and Jersey City, where freight stations will be established. The site on the Delaware River was bought through Charles Cramp last week for \$330,000.

## MANUFACTURING.

### Iron and Steel.

Princess Furnace, at Wilton, Va.; blew out on the 20th ult. for repairs. The furnace has been in successful operation for the past two years.

No. 1 Furnace of the Chestnut Hill Iron Ore Company, Reading, Pa., again became a producer on the 8th ult., and is doing well.

Wharton Furnace (formerly Port Oram), Port Oram, N. J., long on the idle list, has been modernized and will be lighted early in April.

All three of the furnaces of the Coplay (Pa.) Iron Company are now idle pending repairs. One will resume in about two weeks, another about the middle of April, while the third is not likely to go in for some time.

Cleveland Furnace, operated under lease by Pickands, Mather & Co., Cleveland, has just blown in, having undergone extensive repairs. No. 2 stack has been dismantled.

Gordon, Strobel & Laureau, Limited, have closed contract with Geo. P. Whitaker Company, Maryland, for two firebrick stoves to be erected at Principio Furnace. A new furnace plant, complete, is also being constructed.

The New Castle Steel Company, of New Castle, Pa., are now successfully running their new wire rod mill, making No. 5 rods and larger, for the open market.

The Texas Rolling Mill and Iron Works is the name of a new corporation organized at Ft. Worth, Texas, for the purpose of manufacturing merchant bar iron. They expect to be at work in April or May of the present year. The officers of the company are as follows: G. E. Beach, president and general manager; J. G. Williams, vice-president; H. Schwartz, secretary; E. H. Keller, treasurer; P. H. Durack, superintendent. The company's post-office address is Post-Office Box 462, and their office is located on Third street, Ft. Worth.

The rolling mill of the Stewart Iron Company, Limited, at Sharon, Pa., has been closed down for the purpose of making a number of improvements. A new squeezer is being put in, and the firm are overhauling and remodeling their muck train. The plant will be idle for about two months.

The Illinois Coal and Iron Company, at Shawneetown (financial offices at New York), have received license to incorporate. The objects named are to mine coal and manufacture iron, coke and steel. Capital stock, \$1,500,000; incorporators, J. S. Wilkes, A. Marshall, W. S. Brown.

Albert Glass, employed by the stockholders of the Spaulding Iron Company, of Brilliant, Ohio, to examine the books, has made his report. The assets foot up \$455,952.35, which includes \$324,630.35 real estate and improvements, \$44,370.62, Trustees, Graff, Bennett & Co., and a long list of items of materials, papers, &c., ranging from \$4000 down to \$21.95. The liabilities, as reported by the examiner, include \$287,500 capital stock; bonds, \$89,000; wages due, \$5,425; Sharon Iron Company, \$6,764.36; in all showing a balance against profit and loss of \$56,591.18. It is said that the dead assets, including the Graff, Bennett & Co., paper, will add \$50,000 more to the balance against profit and loss.

The new plant of the Carpenter Steel Company, at Reading, Pa., has been completed and was put in operation last week,

giving employment to about 100 men. The starting of the plant was celebrated with speech-making and a fine lunch served to the employees. The new mill, which is fitted with the most improved steel-making machinery, is 120 x 192 feet in size. It contains five hammers, the largest with a capacity of 2 tons and the smallest with a capacity of 250 pounds. Three large cranes and one 16-inch and one 7-inch mill and a 10-inch train of rolls have also been completed. Eighteen converters, with a capacity of 9 tons of fine steel per day, have also been completed, and it is the intention of Mr. Carpenter to shortly increase the number of converters to 42, which will have a capacity of 25 tons per day. Six puddling and six reheating furnaces will also be erected in the main mill as soon as possible, as well as a 2000-pound puddle hammer. An addition, to be known as the chilled mill, 40 x 60 feet, is being erected to the old mill, and will be completed in about two weeks. This will be supplied with a 150 horse-power engine and six sets of cold rolls. The officers of the new concern are as follows: James K. Wright, president; Robert W. Hawkesworth, treasurer, and J. H. Carpenter, general manager.

Land has been purchased in Cleveland, at a cost of \$12,500, for the extension of the Excelsior Iron Works.

Furnaces D and G, of the Crane Iron Works, at Catasaqua, Pa., were put in blast last week. All the furnaces of the above company, seven in number, are now in successful operation.

Carp River Furnace, of the Carp River Iron Company, at Marquette, Mich., was put in blast on the 28th ult., after a long idleness. It will turn out about 50 tons per day of charcoal iron.

The Pennsylvania Tube Works, of Pittsburgh, are contemplating some extensive improvements and enlargements to their plant in that city. Last week a number of contractors were invited to send in proposals on material and on the construction of the large buildings it is proposed to erect. As yet the company have not decided definitely on what improvements will be made, but is the intention to considerably increase the present capacity of the plant.

William Weihe, president of the Amalgamated Association of Iron and Steel Workers, returned to Pittsburgh last week after a trip through a number of manufacturing towns in Ohio. He organized at Salem two lodges, which will be named Buckeye and Perry, and at Findlay he formed two more, which received the names of Findlay and Blanchard lodges.

The 9-inch department of the Upper Union Mills, of Carnegie, Phipps & Co., Limited, at Pittsburgh, was closed down last week for making some needed repairs. As soon as these are completed the mill will start up, after which the 20-inch mill will be closed down for repairs.

The Bessemer plant formerly owned by the Hainsworth Steel Company, located in Pittsburgh, but recently purchased by the Oliver & Roberts Wire Company, Limited, of that city, will be put in operation during the present week. A large number of improvements have been made in the plant, and it is now one of the best constructed in the country. The plant will give employment to about 200 men when put in operation.

We have already made mention of the fact that Carnegie, Phipps & Co., Limited, of Pittsburgh, had received a contract for 3½ miles of the elevated road to be erected in Chicago. The Oliver Iron and Steel Company, of Pittsburgh, have also received a contract for a portion of the structure. To complete the road will require about

8000 tons of structural material, and it is probable that it will nearly all be made in Pittsburgh.

W. P. Tyler, of the Tyler Tube Company, late of South Boston, Mass., but whose plant is being removed to Washington, Pa., was a visitor in Pittsburgh last week. Mr. Tyler states that the buildings for the new plant must be completed on the 10th inst. The entire plant is expected to be in operation on April 1 next.

The Lockhart Iron and Steel Company, of Pittsburgh, have made application for a charter. This firm recently purchased at sheriff's sale the Vulcan Forge and Iron Works, of Long & Co., at Chartiers, Pittsburgh. Mr. Charles Lockhart, of the Standard Oil Company, is the principal stockholder. He informed the representative of *The Iron Age* that the plant will be put in operation at the earliest moment possible. No changes will be made in the plant at present; the same product will be made as was turned out before the failure of Long & Co. The plant will probably be put in operation not later than the 15th inst. The new concern have opened an office in room 83 in the Westinghouse Building, Pittsburgh.

Furnace H, of Carnegie Bros. & Co., Limited, at Braddock, Pa., has been completed and was put in blast on the morning of the 28th ult. The match was applied by Miss Jennie Frick, daughter of H. C. Frick, chairman of the firm. All the furnaces of the above firm at Braddock, eight in number, are now in successful operation. Furnace I is approaching completion, and will be ready for blast in about two months.

The new open-hearth steel department recently added to the Solar Iron and Steel Works of William Clark's Son & Co., at Pittsburgh, is about completed, and will be put in operation during the present week. The plant is equipped with all modern improvements and will have a capacity of from 10 to 12 tons per heat. The product will be used in the company's hoop and band mill, and if the product is more than enough to supply the mill the balance will be sold in the open market.

Riter & Conley, boiler manufacturers, of Pittsburgh, are engaged in the construction of several oil tanks which have been ordered by an oil company in Peru, South America. The tank sheets will be punched and covered in Pittsburgh and workmen will be sent to South America to erect them. It is understood that this is only a trial order and will be followed by others if satisfactory. This firm have also on hand the erection of the Clifton Iron Company's second charcoal iron furnace at Ironton, Ala., and the new coke furnaces being erected by Eastern capitalists at Max Meadows, Va. Work on both of these furnaces is progressing rapidly.

The Bellaire Nail Works, of Bellaire, Ohio, have leased the two idle blast furnaces of the Ohio and Western Coal and Iron Company at Floodwood, Ohio, and will operate one or both of them while repairing and relining their own furnace.

No. 3 blast furnace, of the E. & G. Brooke Iron Company at Birdsboro, Pa., which has been idle for some time undergoing repairs, has renewed operations. It has a capacity of about 700 tons per week.

Fire was lighted in the new blast furnace of the Mont Alto Iron Company, at Mont Alto, Franklin County, Pa., on Wednesday morning, February 26. Everything proved to be in excellent working condition, and the start was all that could be desired, the first cast of 7 tons No. 2 pig iron being made in 17 hours after fire was lighted. The steam blooming department of these works promptly re-



sumed work to its full capacity, and activity prevails at mines, quarries, and in every department of manufacture.

The lease of the Lobdell Car Wheel Company, of Wilmington, Del., on the Walton Furnace having expired, they have discontinued its operation, and the furnace will now revert to its owner, Jerome Blair, of Max Meadows, Va. The company also operate the Brown Hill Furnace at Red Bluff, and the White Rock Furnace in Smythe County, Va. A new hot blast oven is soon to be put in at the latter furnace, and after undergoing other general repairs the furnace will be blown in.

#### Machinery.

Wm. Tod & Co., founders and machinists, of Youngstown, Ohio, have contracted with W. B. Pollock & Co., boiler manufacturers, of that city, for a 125 horsepower boiler to be built of the best steel. They have also purchased and will set up immediately in their forging department a 3150-pound steam hammer. Wm. Sellers & Co., Incor., have the contract for furnishing the hammer.

A plan is under consideration for the removal of the machine shops of the Baltimore and Ohio Railroad at Cumberland to a new site not far distant and at the same time greatly to enlarge them.

A Leslie rotary snow-plow has just been shipped from the Leslie Brothers Mfg. Company's works in Paterson, N. J., for the Southern Pacific, the second for that road this season. A few days ago a Jull rotary snow-plow was shipped from the Rogers Locomotive Works. Both these patent snow-plows are manufactured in Paterson, and the rotary plows are in great demand to break the enormous drifts of the West.

The new locomotive shop built by the Pennsylvania Railroad at Altoona is about finished. It has a capacity for 150 locomotives per year, and the Pennsylvania will buy no more from builders. The works will employ 1000 mechanics and \$500,000 worth of machinery will be placed in them.

The Jeffrey Mfg. Company, of Columbus, Ohio, have just issued a new catalogue and price-list for 1890. It is a handsome book of 200 pages, containing illustrations and descriptions of their different styles of conveying and elevating machinery.

The Robinson-Rea Mfg. Company, of Pittsburgh, have received an order from the Morehead-McCleane Company, proprietors of the Soho Iron and Steel Works, in that city, for a 60-ton guillotine shear to cut 1½-inch steel plate. It has 110-inch knife and is driven by a 14 x 18 inch engine attached.

G. A. Crosby & Co., Chicago, last week shipped a large order of tin-can machinery, consisting of presses, dies and special tools to one of the principal cities in Germany. The purchasers intend starting the manufacture of cans for their own use. Since the first of this year they have completed and shipped one lot of can machinery to New Zealand and another to Buenos Ayres, each having about the same number of presses, dies, &c., as that which has gone to Germany. Much of the special machinery is of original design and pattern, produced by Messrs. Crosby & Co., exclusively for the purchasers. Nearly all of these foreign orders contain specifications for tools that are not in general use, which, at times, are so constructed that great ingenuity is required to make them a practical success.

The Walker Mfg. Company, of Cleveland, Ohio, have just secured a contract for the entire cable-driving machinery for the Cleveland City Railway Company. In this plant, which will be very complete in

every particular, will be used the differential cable drums made by the Walker company, and which were recently illustrated and described in this paper. By means of these drums, as our readers will recollect, all unequal wear which destroys the ordinary common drum is done away with, each groove being mounted independently of the others, and being free to assume any position on the shaft according to the tension of the rope.

The amount of work done by the Valley Pump Company, of Easthampton, Mass., during the month of February may be judged from the fact that pumps were shipped to 18 States.

The Kilbourne & Jacobs Mfg. Company, Columbus, Ohio, recently increased their capital stock from \$400,000 to \$500,000, and during the past year have added largely to their manufacturing facilities by the addition of new and special machinery. Their trade for the last four months of 1889 is stated to have been 50 per cent. greater than for the corresponding period in 1888, and their export trade has reached to very large proportions.

Shultz Belting Company, St. Louis, Mo., are enjoying an excellent trade in what is known as Shultz Patent Pulley Covering. This covering has many points of merit, which are fully explained in a circular which they are sending out to the trade. They are receiving orders from all parts of the country, many of them coming from South American points and also from some parts of Mexico.

Curtis & Curtis, of Bridgeport, Conn., manufacturers of pipe cutting and threading machinery, report business very good with them and they are still running their large works over-time. They have orders on hand for a large number of their machines unfilled and very little finished stock on hand. But as their output is large, they still continue to fill orders promptly.

The annual meeting of the stockholders of the Standard Car Heating and Ventilating Company will be held at the office of the company in Pittsburgh on Tuesday, the 11th inst., to elect directors and consider regular business.

The Sioux City Engine Works are just starting up the work in their new buildings at Leeds (Sioux City's new manufacturing suburb). The foundry has been in operation for some little time, and is of fully four times the capacity of their old foundry, which will enable them to make a specialty of foundry jobbing and heavy contract work, such as architectural iron work, as well as iron street and cable railway car castings; standard railway castings, and contract work for manufacturers. The Sioux City Engine Works have on hand a large number of orders for engines, mostly of the larger sizes, which they will push forward when they are in their new works. They have fitted up their machine shop with rope transmission throughout, also with one of the Buffalo Blower Company's large heater and blowers for warming their buildings, and will put in one of the Hawkeye Electric Company's dynamos for lighting their works. They have already placed some orders for new tools, and are selling off quite a number of old tools to be replaced by heavier and stiffer machines of later designs. The object being to thoroughly equip these works with the most improved machinery and thereby put them in a condition to compete with any works of the kind in the country, since they have the largest and best arranged plant for their specialty of any company in the West. They have recently issued a new boiler circular, showing the types and sizes of boilers they build, together with a very neat—in fact, handsome—design of fronts. They will

make a specialty of high-grade boilers without trying to compete with the cheaper class of trade, their object being to aim for quality first and to take a position of first rank in the country for quality on both engines and boilers. They also have in preparation new circulars of both types of engines—namely, the Sioux City Corliss and the Giddings automatic high-speed engines, also of their boilers, which will soon be ready to send to applicants. While collections are somewhat slow and difficult to make throughout the Northwest at this season of the year, the outlook for business from this point is more than promising. Several large manufactories have been recently located at Sioux City, and it will, without doubt, in the near future, take a position among the leading manufacturing centers of the Northwest.

The Cape Ann Drop Forge Works were recently incorporated under Massachusetts laws, with the following officers: W. N. Fisher, president; N. H. Phillips, vice-president; Geo. R. Bradford, treasurer, and Geo. D. Loud, secretary and agent, with offices at Mason Building, Kilby street, Boston. Mr. Loud, the general manager, is the owner of the Loud patents on pumps and round edge tackle blocks. The plant of the new enterprise is being erected at Gloucester, Mass., and will consist of a main building 150 x 40 feet and an annex 48 x 50 feet. A side track of the Boston and Maine Railroad connects the buildings with the main line. They expect to be ready to fill orders May 1.

#### Miscellaneous.

The Mill and Mining Electric Equipment Company, of Pittsburgh, have received a charter of incorporation. The incorporators are W. A. Giles, John A. Scully, J. V. Patton, F. W. McKee and W. J. Burns. This company propose to erect a plant for the manufacture of supplies in Allegheny.

The Kidd Steel Wire Company, Pittsburgh, Pa., have recently introduced polished drill rods in a large electrical plant in New England, their goods being preferred to others of both English and American make. Their steel is referred to as meeting with special favor among accurate and critical consumers.

Grant C. McNeil, Akron, Ohio, has recently started a shop for the manufacture of his line of tubular steel barrows. This shop is fitted with all necessary tools and has a good corps of men. The barrows have heretofore been made by contract, but the demand for the goods requires facilities which will permit more prompt and extensive manufacture.

Hollow Cable Mfg. Company, Hornellsville, N. Y., report that business continues very good and they are full of orders.

The Atlas and Cyclops Works, of England, have received heavy orders for armor plates for the eight large battle-ships which are the dominant features in the Admiralty programme.

Capt. Eugene Griffin, general manager railway department Thomson-Houston Electric Company, read a paper on "The Transmission of Power by Electricity" before the Boston Society of Civil Engineers.

The great bridge across the Ohio River at Wheeling will be completed about June 1. The main span, building by the Edgemoor Company, is 524 feet long, and weighs 4,000,000 pounds, being the largest in the country. One of the four railroads connecting with it brought into Wheeling 280,000 tons of iron ore, and the same road has contracts for 350,000 tons this year.

# The Iron Age

New York, Thursday, March 6, 1890.

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JOHN S. KING, - - - BUSINESS MANAGER.

The publication in *The Iron Age* of supplementary telegraphic reports from the principal Western iron markets has met with an approval so general that a further step in the same direction has been taken. With this issue we begin the publication of a full telegraphic report from Chicago and from Cincinnati. Henceforth the entire market report from the two points mentioned will reach *The Iron Age* at the latest moment practicable.

## Chicago's Advantages Increasing.

We have had frequent occasion during the past two years to comment on the prevalence of comparatively low prices for iron and steel products at Chicago. More than once in that period have prices not only gone down to the level of other Northern iron markets, but they have descended to an even lower point. It was apparent long since that the time had passed when the market rate at Chicago was the price at Pittsburgh or Youngstown *plus* the freight. Those who are interested in comparing the market reports from various sections have latterly noted the fact that Chicago prices ranged about the same as at other Northern points. Pig iron is notably prominent in this regard. Other industries being based on pig iron, they are more or less affected by this circumstance, according to their stage of development at Chicago.

The slight depression in the pig-iron market now prevailing is felt with special force by the Chicago trade. Prices seem to have receded there to a point lower than other Northern markets. This is a curious circumstance, especially in view of the fact that with the exception of Bessemer pig iron there was no serious inflation of values during the active condition of business which prevailed the latter part of last year. It can be partly explained by the unloading of surplus stocks in consumers' hands and of speculative lots by tired or scared holders, but the same is probably true of other markets to a greater or less extent. The assertion is now made by some of the local leaders of the trade that Chicago may measurably sympathize with other markets and rise with them, but it is destined for the future to be a low market. The time is at hand when the local supply of pig iron will meet all the requirements of consumers in the Northwest, and the local manufacturers will push their claims to the control of their own home market. This is, of course, not welcome news to pig-iron producers elsewhere, but they are obliged to face the truth, however unpleasant it may be.

For a long time the Chicago manufacturers have been looking for a supply of

coke in other directions than Connellsville, seeing the enormous growth of the demand upon the resources of that region and anticipating a permanent advance in the cost of that essential blast furnace fuel. West Virginia has afforded them some assurance of relief, but transportation facilities have hitherto been somewhat inadequate in that direction. We are assured that in a very short time new railroad connections now building will be completed, whereby New River and Pocahontas coke can be delivered in Chicago at rates considerably lower than those heretofore charged, while they will be so far below the rates from Connellsville that great advantages will be realized by the Chicago consumers of coke. New blast furnace projects are already taking shape in the World's Fair city, based upon the prospective cheap fuel. Should these enterprises include the ownership of Lake Superior ore mines and West Virginia coking coal fields, as now seems quite probable, the concentration of all profits in the operations of blast furnaces would enable the owners to make prices lower than the distant furnaces could possibly touch, and still net a satisfactory profit. Estimates of cost based on such a plan of operations are startlingly low, as compared with figures heretofore realized by Chicago furnacemen, and come close to the average cost of pig iron at well managed Southern furnaces. Those who have these Northern schemes in charge insist that as Southern manufacturers, owning their ore and coal supply, give their pig iron output the benefit of cheap raw materials there is no reason why Northern manufacturers should not adopt the same plan if they are similarly situated. Whether times are good or bad, it may be safely predicted now that the coming two years will witness great changes in the iron trade at Chicago. The improvements being made by the Illinois Steel Company will, of course, count heavily in bringing about these changes. The enormous increase they are making in their blast furnace capacity and the wider range they are giving to their finished products will alter long-established currents of trade. But, independently of their operations, other capital is entering the field and other combinations of manufacturers are being formed to participate in the Northwestern iron trade.

## Sheffield Iron In Pittsburgh.

While Sheffield, Ala., has been rejoicing at the shipment to Pittsburgh of a considerable quantity of pig iron, the manufacturers of what was once the Smoky City have been industriously throwing cold water on the new movement. Some of the Pittsburgh newspapers have quoted ironmasters whose views are certainly founded on very limited knowledge of the facts. The persons alluded to have promptly condemned the pig iron on the general ground of its unfitness for their purposes. They are doing injustice to the Sheffield industry, whatever may have been their experience with some other makes of Alabama and Tennessee

irons, made from red ores and local cokes. The Sheffield furnaces use brown ores either exclusively or in preponderating quantity, and are running on Pocahontas coke, which is admitted to be the equal of Connellsville. Their product, therefore, cannot be fairly compared with that of some of the other districts, nor is it just to leave out of consideration the general fact that Southern furnacemen handle their plants considerably better than they did five years ago. We have been given the following analysis as typical of Sheffield No. 1 foundry and gray forge:

	No. 1 foundry. Per ct.	Gray forge. Per ct.
Graphitic carbon.....	3.37	....
Combined carbon.....	0.24	....
Silicon.....	3.28	0.66
Sulphur.....	0.000	....
Phosphorus.....	0.58	0.55
Manganese.....	0.63	0.52

The point has been raised, very correctly, that Pittsburgh is not a large market for foundry irons, and the conclusion has been drawn that therefore the sales of Southern iron there will not be large. This, it seems to us, is hardly a correct inference, since the Sheffield furnaces naturally make considerable forge iron, of which Pittsburgh is able to take a good deal, and if the trials prove satisfactory will consume to a considerable extent. Of course it is necessary to bear in mind one point, and that is that iron received by water is primarily best available to those concerns at Pittsburgh and along the Ohio Valley which have the adequate facilities for handling it.

It is clear that the shipment by water of Southern iron to points on the Ohio River will prove a potent factor in those markets. It brings into them a new contestant with some points in its favor, and the pressure exerted from this quarter will be transmitted indirectly to others in Ohio and Western Pennsylvania.

## The Consumption of Rails.

It is a fact generally conceded that the market for steel rails has been sagging lately and that prices are quotably lower, with every indication that concessions will be obtained in the next large blocks negotiated. Buyers are so thoroughly convinced of this probability that contracts for rails are not placed in large blocks, but are offered in small quantities from time to time. Although the mills are, generally speaking, quite well supplied with orders for the first half of this year, competition is growing keener as the end of that time is approaching. While the present situation gives support to those who are looking to lower prices, some circumstances must be taken into account. The mills have all purchased new material very largely, having covered to an unusual extent their year's requirements. They will, therefore, much more quickly reach the point where cost sheets call a halt upon the salesman.

The demand for rails comes from two sources—for new construction and for renewals. A very fair approximation to the former may be reached from the care-



ful compilations of new mileage added annually to the network of railroads in the country. There are, however, some difficulties to contend with which render accurate statements of consumption for this purpose impossible. The quantity of rails required per mile of track varies within very wide limits. It is only 61.5 short tons for narrow-gauge and as high as 100 tons for standard roads. Besides this, the weight of the rails used is much greater to-day than it was ten years ago. It may be assumed that in 1867 the average was 90 tons per mile, gradually increasing until it is now 100 tons per mile. Another point to be considered is the mileage of second track, sidings, &c., which, too, has steadily increased. From present statistics it would appear that the accessory tracks add about 20 per cent. to the number of miles of new road built every year to get at the actual of track laid. Thus a series of figures are obtained on the basis of the number of miles of railroad constructed annually, from which a fair estimate of the quantity of rails used for this purpose may be deduced. On the other hand, we know from the statistics of production of iron and steel rails, carefully collected annually by the Iron and Steel Association, and from the imports of rails, how large the apparent consumption is every year. This, of course, neglects the stocks in makers', consumers' and importers' hands, which, however, in the case of rails are a less important matter than in the majority of other commodities. The difference between this apparent total consumption and the quantities used for new mileage would fairly represent the consumption for renewals. The following table has been computed in the manner indicated, the basis being the net ton:

Year.	Increase of mileage.	Total consumption.	New roads.	Re-novels.
1867..	2,449	627,157	279,200	347,957
1868..	2,979	756,795	339,600	417,195
1869..	4,615	906,749	504,000	402,749
1870..	6,070	1,019,153	663,000	356,153
1871..	7,379	1,341,434	814,800	526,634
1872..	8,878	1,530,850	648,900	881,950
1873..	4,107	1,148,849	453,400	695,449
1874..	2,167	837,724	231,900	605,824
1875..	1,712	810,770	191,000	619,770
1876..	2,712	879,716	302,000	577,716
1877..	2,281	794,744	357,300	437,444
1878..	2,687	882,005	303,000	579,005
1879..	4,721	1,157,430	532,500	624,930
1880..	7,174	1,752,536	817,800	934,736
1881..	9,789	2,230,421	1,116,000	1,114,421
1882..	11,491	2,912,321	1,321,000	1,591,321
1883..	6,755	1,399,671	770,100	629,571
1884..	3,977	1,144,850	453,373	691,477
1885..	3,131	1,093,667	356,924	736,743
1886..	8,647	1,760,000	946,989	813,011
1887..	12,872	2,450,869	1,544,450	906,419
1888..	6,801	1,593,377	816,130	777,247
1889..	5,300	1,596,196	636,000	960,196

Repeating former comments on this table, it will be noted that in a general way the quantities for renewals fluctuate far less violently than do the amounts used for the construction of new roads. The figures for the latter lap over, of course, from year to year—that is to say, a considerable proportion of the rails produced in one year are in reality for consumption in the next, and the variations from year to year, therefore, appear more violent than they probably are. This partly explains such apparent anomalies as are exhibited by the

fact that, although the mileage of new roads built in 1882 was much larger than it was in 1881, the consumption of rails shows a heavy decline. Of course, being deducted from the tonnage for new road-bed, the requirements for renewals are in a similar manner less subject to sudden variations than indicated in the table.

The most significant point in connection with the table presented is that evidently, considering our now enormous mileage, renewals have been very light since 1882. We are convinced that the purchases on this account must be heavier this year than they were in 1889.

So far as new construction is concerned, the able summary of the prospects for this year, published in the last issue of *Engineering News*, is extremely encouraging. We may frankly state that the figures submitted by our contemporary exceed by far our expectations. *Engineering News* estimates that 5038 miles of railway are now partially completed or in process of construction; that 7041 miles are surveyed or under survey, and that 2831 miles of lines are not yet surveyed, but are being pushed by projectors with such energy that the prospects seem fair for the beginning of actual work before the close of the year.

Of course, developments in financial circles and many other circumstances must greatly influence this work, but it seems a modest inference to draw from the investigations of our contemporary that at least an equal mileage will be added to our railroad system this year, as there was last.

It is safe to conclude, we believe, that the consumption of rails will be heavier in 1890 than it was in 1889. It is not unreasonable to hope that it will reach 1,800,000 net tons. Some authorities in the trade estimate 2,000,000 tons. We are inclined, in view of all the circumstances, to regard the latter figure as high, although it is not impossible that it may be reached or may even be exceeded. With 1,800,000 tons in 1890 prices cannot decline much; with a consumption of 2,000,000 tons they must develop a rising tendency before long.

#### Dominion Finances.

The financial situation in Canada, as shown by an examination of the bank accounts, is such that the ministerial organ in Montreal deems it advisable to speak a word of caution. Not only within the year, but during the last five years, the resources of the banks have decreased at the same time that expansion has continued as an increasing ratio. During the year the most striking change that has occurred is in the assets, the result of a pressure for credit, more particularly in the shape of mercantile loans. Thus it appears that there is a decrease of about \$11,000,000 in the reserves, which drop to \$32,375,000, due to the dull state of trade, slow remittances and the necessity of drawing on bankers' credits to meet foreign indebtedness. "Five years ago—namely, at the close of January, 1885—the commercial loans of banks aggregated \$137,738,000, or \$35,500,000 less than at the present

time; on the other hand, the cash reserves and foreign balances then amounted to \$35,511,500, as compared with only \$29,769,000 at the present time, showing how greatly credits have been expanded in the interval."

The Dominion organ, in the interest of the public weal, does not hesitate to say that "the process of expanding the top of the cone and whittling away at the base" cannot go on indefinitely. As the export trade is not particularly promising, the contrary rather, it is only the part of ordinary prudence to restrict imports to the limits of moderation, especially as the draft on foreign balances has been augmented by the necessity of remitting large amounts annually to meet the interest on loans negotiated by the Dominion Government two years ago in connection with the Pacific Railway. It is obvious that the era for profuse expenditure and reckless appropriations in the Dominion has come to a close, at least until her agricultural prospects and her industries in their various departments have changed greatly for the better. Revenues from customs and public works alike are liable to be curtailed rather than increased, and retrenchment, public and private, must be the order of the day.

#### New Railroads Projected in Central America.

Since the failure of the Panama Canal Company and the commencement of work on the Nicaragua Canal, American and English enterprise in the way of interoceanic railroad building is becoming more and more active in Central America. Thus, a line of railroad is soon to be completed from Guatemala City to Port Barrios, near the mouth of the Melagua River; in other words, Guatemala is to have a line of railway direct from ocean to ocean. The portion in running order is stated to have just been purchased by a syndicate of wealthy American capitalists, believed to be the owners of the Southern Pacific Railroad. The franchise permitting the completion of the railroad across Guatemala is said to have also been purchased by the company. It is stated, in connection with this piece of news, that C. P. Huntington, of New York, suggested and arranged the transfer of the property. The transshipment of freight across the country will save many days and many miles on the route from New York to the West Coast ports of South America. A steamship line from Tampa, Fla., to Port Barrios would shorten the distance still more. The 80 miles of the Guatemalan Railway already built cover the difficult part of the roadways.

The Costa Rican Government has meanwhile granted concessions to an English syndicate, which will at once proceed with the construction of a railroad across Costa Rica from the Pacific to the Atlantic, between the two ports of San José and Esparta. The line will run a short distance south of the projected Nicaragua Canal, and a spur will be built northward to connect with the latter. When finished it will enable

the passengers and mails to go across in ten hours. The new road will be 36 miles long. Although it will be built across the Andes range of mountains, there are no difficult feats of engineering to accomplish, and it is thought the line will be finished within a year. Finally, the Nicaraguan Government granted a concession for a railway connecting Matagalpa with the East Coast at the mouth of the Ramos River, to Don Pedro Ramirez, of Managua, who has sold it to an English syndicate. This road would be 90 miles long, and would tap the rich mining districts of Acoyapa and La Libertad.

Since work began on the Nicaragua Canal the enlivening effect is becoming perceptible of the gradual development of harbor improvements at Greytown, the establishment of dwellings, hospitals, machine shops and warehouses along the beach, the arrival and departure of steam and sailing ships in the service of the Maritime Canal Company and the passage to and fro over the route of the projected canal of engineers, contractors and prospectors are the tangible evidences of the approach of a new era, the effects of which are being realized in channels far removed from the immediate scene of activity. Activity in entries of public lands and transfers of private estates are another indication of awakening life. Properties lying between the Pacific and the lakes, and readily accessible to the seaports, are firmly held, and inquirers now have to go further afield. The high price of coffee, and the profits derived from the cultivation of this leading product of tropical America, have moreover directed attention to such districts as are adapted to its production. In the Department of Matagalpa 500,000 trees were planted last year.

A line of Government steamers is soon to replace the private craft plying on Lake Managua, between Managua and Momotombo, thus making a through line from Granada to Corinto. At Greytown the pier, which is the first essential to enable the dredgers to open the harbor, is making rapid progress, about 250 feet being now completed. This work is proceeding at the rate of about 60 feet per week, and its effect has been even greater than was calculated upon by A. G. Menocal, the chief engineer, the action of the waves in piling up sand having so far saved brushing and filling. Certain modifications and improvements on the line of the canal resolved upon by the staff will reduce the estimates by at least \$2,000,000.

A new life seems to have been infused into Central America, quite as much in Honduras and Salvador as in the three republics we have referred to, and the future of that magnificent and at the same time salubrious region inspires universal confidence.

**Order for Russian Rails.**—A St. Petersburg dispatch to the *London Times* says: "There have never been such large orders for rails from the Russian Government as at the present moment for the ensuing year, and these are all being given to home manufacturers by the Minister of War. The Jastovo line to the Austrian frontier is to be built on a double line of

rails to be laid down on the Kursk-Kiev line. In fact, all Southwestern lines are to be furnished with double rails. The strategical line to Petrovsk, on the Caspian, is also to be commenced in the course of the year, and probably some progress will be made as regards the great Siberian line by preparations for building the important strategical section in the Trans-Baikal from Stretensk, which is insisted upon as a necessity by the Governor-General of the Amoor province. What is considered as rather ominous is that all the new and double lines in European Russia for which orders are now being given out are to be finished by 1892, when the rest of Russia's military reorganization is expected to be completed."

## PERSONAL.

S. F. Luty, assistant secretary of the American Tinned Plate Association, has returned from a trip through the West.

Passed Assistant Engineer E. H. Freeman is ordered to special duty at the Quintard Iron Works in connection with fitting up new machinery for the new vessels.

Dr. Edward W. Morley, Professor of Chemistry at Adelbert College, Cleveland, Ohio, was badly injured by the explosion of a glass jar containing uranium.

Charles H. Haswell, who since 1886 has been Supervising Engineer in the Department of Public Charities and Correction, tendered his resignation, to take effect at once. Mr. Haswell is one of the oldest and best known theoretical and practical engineers in the city. President Porter said that the reason for his retirement was simply that there was no more work for him in the department.

S. D. Boles, for several years cashier of the American Tube and Iron Company, at Youngstown, Ohio, has removed to Pittsburgh, and will in the future be connected with the office of the company in that city.

At the annual election of officers of the J. & J. Rogers Iron Company, held on February 15, H. N. Stetson was chosen president, George Chaboon vice-president and James Rogers secretary.

## OBITUARY.

C. L. MITCHELL.

Charles Lemoyne Mitchell died on the 1st inst. at his house, 111 West Fifty-fifth street, after a lingering illness. He was a native of New Haven, 45 years old. Although he made New Haven his home, he spent much of his time in this city. He was at the head of the Mitchell Vance Company, which he reorganized after the failure of the old firm of Mitchell, Vance & Co. several years ago. He was also largely engaged in several Connecticut brass concerns. Mr. Mitchell was a member of Congress from Connecticut from 1883 to 1886. Since then he has been living almost constantly in New York.

The Mechanical Engineers' Library Association, of this city, has been incorporated. It proposes to maintain a free public library. Among the incorporators are Stephen Wilcox, Charles H. Loring, Fred-eric R. Hutton, Horace See, F. Merriam Wheeler and Stephen W. Baldwin.

Col. Charles H. Banes, chairman of the House and School Committee of the Williamson School, has prepared a pamphlet on manual and trade schools in this country and abroad for use of the committee.

## Washington News.

(From Our Regular Correspondent.)

WASHINGTON, D. C., March 3, 1890.

Chairman McKinley, speaking of the outlook for an early beginning of the Tariff discussion, said:

"The new Tariff bill has been practically completed for some time, but no steps have been taken to bring it before the House on account of the intervention of such necessary preliminary action as the determination of the rules and the disposition of the election cases acted upon by the committee. I think in about ten days we will be ready to submit the bill with the majority report."

The chairman added: "This report will be quite full as it will treat upon the different provisions of the bill in which there have been changes from the existing statutes. We think that the bill is a very fair exposition of the protection sentiment of the country and represents the wishes of the manufacturing interests. The ideas of the manufacturers in the branches of industry represented by the schedules were very carefully ascertained. Therefore if the bill in its main features does not suit them, it is no fault of the majority of the committee, as they were ready to gather information and adopt it, if in any degree reasonable. This might be said to be a manufacturers' tariff bill. We found them very ready to adjust their views to the question as a whole and not to ask special legislation in their own interests regardless of the rest."

The sub-committees of the Committee on Ways and Means having completed their respective branches of the schedules of the new tariff bill made their report to the full committee to-day. The controverted questions which have given the committee more trouble than any other portions of the bill were sugar, wool and woollens and steel rails in the customs, and tobacco in the internal revenue, feature of the bill.

The question as to what reduction should be made on steel rails has perplexed the committee more than any other subject. The sub-committee have conferred with many of the most extensive manufacturers of steel rails, among them Andrew Carnegie. He unhesitatingly informed the committee that so far as his works were concerned he was satisfied that he could turn out steel rails at a profit against competition at even \$5 a ton in ordinary times. But should there be a depression in this branch of production it might be well to impose a duty of \$8 a ton. The only establishment which objected to a large reduction was the Bethlehem Iron Works. They maintained that the reduction should not be more than \$4 a ton.

The committee are satisfied that a larger reduction can be made without jeopardizing the protective feature of this bill as applied to this important industry. The indications are that the full committee will make a reduction of \$7 a ton, which places the duty at \$10 instead of \$17. The committee have also had a great deal of trouble in satisfying the wool and woollen interests. The wool growers have urged a slight increase of duty on certain classes of high grade wools, while the manufacturers have asked for a reduction on wools of the third class, which they claim are not produced in the United States and which are used extensively in carpets and coarse fabrics. But the committee have adopted a schedule which they think is fair and just to all the interests involved.

In the sugar schedule there will be a reduction of the revenue from that source aggregating \$40,000,000, with a bounty of 1 cent a pound on domestic production. The committee have been unable to ascertain that any considerable amount of beet



sugar is produced in this country, and are satisfied that it cannot be profitably under present conditions.

The reductions on the free list, including articles not produced in the United States, will reach \$7,000,000, and total reduction under the bill \$65,000,000 or \$70,000,000.

Commander William M. Folger, Ordnance Inspector at the Washington Navy Yard, and recently nominated by the President to the Senate as Chief of the Bureau of Ordnance, Navy Department, to succeed Commodore Sicard, and confirmed by the Senate, has assumed the duties of his important office and will henceforth be known as Commodore Folger. The new chief is, without exception, the ablest authority in the navy on the subject of ordnance in its theoretical and practical bearings. Commodore Folger was born in Massillon, Ohio, where his father was a distinguished lawyer. His family, however, comes from early Puritan stock. The name of Folger is one of the oldest on the roll of colonists of the sea-girt isle of Nantucket, over two centuries ago. Their deeds of daring on the high seas are among the folklore of that famous seat of the whaling industry of the United States. The Secretary of the Navy of the Arthur administration was a member of the same family, his and the Commodore's grandfathers being brothers.

Commodore Folger began his education in the public schools of his native town, and after graduating at the High School entered the United States Naval Academy at Annapolis from Ohio in 1861. He became an ensign in 1866. After a varied service afloat and ashore he reached the grade of commander in 1885, and was assigned to the command of the vessel of war Grunnebaugh. From this duty he was assigned to the post of ordnance inspector at the Ordnance Yard and Gun Works at Washington in 1887. Under the act of Congress the Washington Navy Yard, one of the oldest and most historic in the country, was converted from a yard of naval construction and storage to a naval arsenal. The necessary appropriations were made, and the work of erection or alteration of the buildings and creation of the massive and complicated machinery began under Commander Folger. To-day the Naval Gun Foundry is a monument to the ability of this distinguished officer. In his new sphere, clothed with greater powers, in a very short time the United States will possess the finest establishment of the kind in the world.

The disposition of the knotty question growing out of the bids for the construction of the two 1000-ton cruisers and one practice ship, for which Moore & Co., of Elizabethport, were the lowest bidders for the three, has been finally settled. It having been decided by the Department and admitted by the bidders that they have not the facilities for the construction of the three vessels they desired to be permitted to build the practice ship and one of the 1000-ton cruisers, but asked to be relieved of the whole bid. There was but one bid on the practice ship alone, which was by Moore & Co. This vessel the Department has decided must be readvertised so as to secure competition. The two 1000-ton cruisers have been awarded to the bidders at Bath, Maine.

The United States Fish Commissioner has awarded the contract for the erection of the steam and water distributing plants at Put-in-Bay, Ohio, to Shaw, Kendall & Co., of Toledo, Ohio.

The Clinton Hall Association has decided to erect a new building for the use of the Mercantile Library on the site of the present structure. It will be seven stories in height.

## PROVIDENCE NOTES.

Sixty tons of horseshoes are daily manufactured at the Rhode Island Rolling Mills, at Valley Falls. Wages among the skilled workmen run as high as \$6 per day.

Thomas Phillips & Co., of Providence, have recently manufactured 40 of the largest copper tanks to be used in the precipitating of crystals ever built in New England, and, as far as known, the largest ever built in the United States. The tanks measure 11 feet in diameter and 7 feet 8 inches in height. The entire lot will be shipped to Brooklyn in a few days, the three-masted schooner Witch Hazel having just been chartered for that purpose.

Potter & Atherton, who for several years past have conducted a thriving machine business, foundry and the manufacture of lappers at Pawtucket, are in as short time as possible to move their business, which has greatly increased, to Central Falls. They have purchased from the stockholders of the Blackstone Iron Works corporation several thousand feet of land of the original property, running north of the "boiler works," so called. They propose erecting, as soon as possible, two large and extensive buildings. One will be used for their machine shop and the other for their foundry work. This location is admirably adapted for the purpose for which it was purchased, it being situated between the main lines of the New York, Providence, and Boston Railroad (Worcester division) and the Old Colony to Boston.

One of the densest fogs ever known to river and sound pilots enveloped Narragansett Bay and Long Island Sound Monday night. Both the steamers Massachusetts and Rhode Island, of the Stonington Line, have recently been equipped with the Huntington system of search lights, which is of late invention, and a great improvement over the old system of penetrating fogs, and both the steamers had excellent opportunities to try their worth Monday night. This was the first thorough trial the light has undergone and the results were highly satisfactory.

When the light was pointed vertically into the fog it was seen at its best advantage. The loom of the light arose to an incredible distance. It was plainly visible at many times the distance at which a plain arc light could be seen.

Its power of penetrating the fog when directed horizontally was also demonstrated. The beam of light made objects plainly visible at a distance of 1000 feet at least, so that a boat could easily have been sent to pick up a man in the water and make sure of finding him.

An ingenious adaptation of this system of search light to the use of navigators has been made on the Sound steamer Rhode Island, under the direction of Captain Miller, of the Stonington line. The light is located on the top of the pilot-house, and is connected with the regular incandescent system of the boat. Then by means of a weight that may be operated by a magnet, the steam fog horn of the vessel is brought under the control of the electric current.

In the pilot-house there are four switches controlling the current that runs to the search light and the fog horn, and by means of these switches the pilot can start the search light so that it will flash at regular intervals automatically; or it may be made to burn steadily; or it may be made to flash automatically at the instant the fog horn begins to bellow and cease to flash when the bellow ceases; or the flashing and bellowing may be done alternately or simultaneously by hand. No such use of electricity was ever made before, and it is the opinion of the officers of the Stonington line that nothing yet

invented will be so valuable as this combination in preventing collisions at sea.

This search light weighs but 180 pounds. It occupies a deck space 2 feet square. It was manufactured by the Scott Electric Works, and is known as the Huntington search light. LEONTIDAS.

## Hardening Iron and Steel.

Watson Smith read at the meeting of the London section of the Society of Chemical Industry a paper by G. G. Theodosieff, on "A New Process for Hardening Steel and Iron." The process consists in the employment of glycerine for tempering these materials. The specific gravity of the solution of glycerine may be varied between 1.08 and 1.26 at 15° C. by adding water according to the composition of the steel. Its temperature may also be varied between 15° C. and 200° C., according to the hardness of the metal, it being found advisable to employ a high temperature for hard steels. To increase the quenching power of the bath various salts may be added to the glycerine solution, manganese or potassium sulphate being added when a hard temper is required, and manganese chloride or potassium chloride for a softer temper. The advantages which the author claims for his method are (1) the temperature of the aqueous solutions of glycerine may be varied within wide limits, as the boiling point of pure glycerine is 290° C.; (2) the variation in the quenching power of the solution by dissolving these salts in the liquid has a very marked influence on the degree of temper, and renders it possible to treat very different qualities of steel by this method.

Three specimens of steel were exhibited—(1) in which no shrinkage was shown, proving that it was applicable to steel which had not been forged; (2) a specimen which had been bent on itself cold, and having a tensile strength of 65 tons and an elongation of 15 to 18 per cent.; and (3) a piece of forged steel which had been tempered by this process.

The composition of the steel from which these samples were prepared showed on analysis that it contained 0.7 per cent. carbon, 2.2 per cent. chromium, and 0.15 per cent. silicon. The author, who is engaged for the Russian Government, states that the authorities have adopted this process, and have succeeded in making a 12-inch projectile hardened by this process break through a 16-inch armor plate.

President Geo. deB. Keim, of the Philadelphia and Reading Coal and Iron Company, in his report of the operations of the company for the year ending November 30, 1889, compared with the previous year, gives the following interesting information: Total receipts, \$17,818,225; expenses, \$18,435,709; less value of 180,596.01 tons of coal added to stock at shipping points, the cost of which is included above, \$469,633; total, \$17,966,075; add interest on bonds outstanding, \$803,973, and interest on bonds in sinking fund, \$22,550—\$18,792,598, leaving a deficiency for the year of \$974,373. The report states that the collieries were operated 201 days during the year, a decrease of 20½ days from previous year. This decrease in operation tended to increase the average cost per ton of mining; as a considerable proportion of the expense of maintenance is a fixed charge which must be borne whether the mines are in actual operation or their working suspended. The product could readily have been increased at a slight additional cost. It should also be borne in mind that the price received for coal was less than for the previous year, and to these causes must be attributed the inability of the company to earn the entire amount of its fixed charges.

# TRADE REPORT.

## Chicago.

Office of *The Iron Age*, 50 Dearborn street, CHICAGO, March 5, 1890.

(By Telegraph.)

**Pig Iron.**—The condition of trade is practically the same as stated in our last report. The market is quiet and very unsettled. What few buyers there are confine themselves to small lots for immediate use. Local Foundry Irons seem to be the weak point in the trade. Concessions that have previously been made have the effect of disturbing the views of the buyers regarding the future, and deterred many who decided to purchase from placing orders. Buyers of round lots would, under the present state of things, in all probability, be accommodated at a shade under quotations. There are still speculative lots available that menace immediate improvement, notwithstanding that these lots embrace mixed grades, which would not be serviceable to the general trade. All manufacturers of Pig Iron contend that the dullness is only temporary and are taking the most hopeful view that they can gather from the condition which will govern the market in the future. The increased cost that will be figured in the product when they begin using ore and fuel under contract for this year is their strong argument against lower prices on Iron for delivery after April 1. On immediate trade there is a disposition on the part of manufacturers to meet buyers, many of them having authorized the acceptance at 50¢ per ton below the list price arranged several weeks ago. This is not sufficient, however, to induce sales. On Lake Superior Charcoal an offer of \$1 per ton below the quoted price was made for 1000 tons, which was declined. Lately there has been some inquiry for Bessemer Iron, but the price asked by manufacturers is from \$1 to \$2 per ton higher than consumers are willing to pay. There is a fair demand in small lots for American Scotch and Silvers for immediate shipment. The following quotations, f.o.b. Chicago, are the basis for cash transactions at the close of business on Tuesday evening: Lake Superior Charcoal, \$22.50 @ \$23; Local Coke Foundry, No. 1, \$18.50 @ \$19; No. 2, \$18 @ \$18.50; No. 3, \$17 @ \$18; American Scotch, \$21.25; Southern Coke, No. 1, \$20; No. 3, \$19; Gray Forge, \$18.50; Mottled, \$17.50; Tennessee Charcoal, No. 1, \$21 @ \$21.50; Alabama Car-Wheel, \$25 @ \$26.

**Bar Iron.**—There has been a slight improvement in the inquiry for Bars. The majority of mills are pretty well supplied with work, but have been unable to secure specifications, which leaves them slack for immediate business. This has consequently increased competition and weakened prices. Manufacturers are now quoting 1.85¢ @ 1.90¢, half extras, on store orders and 1.80¢ on car specifications, Chicago delivery. The Mahoning Valley mills are not inclined to meet these figures, and are asking 1.75¢ at mill, many of them refusing to book orders, except for immediate delivery. They have also taken a conservative position in regard to employing their full capacity, so that in case labor troubles should occur May 1 or July 1 they will not be caught with a large amount of unfinished orders on their books. Small lots from store are unchanged at 2¢ @ 2.10¢.

**Structural Material.**—Architects and builders are doing a great deal of figuring and there is every prospect that there will be a great deal of building during the com-

ing summer. Manufacturers quote mill lots as follows, f.o.b. Chicago: Angles, Iron or Steel, 2.45¢ @ 2.55¢; Universal Plates, Iron, 2.50¢; Steel do., 2.55¢ up to 16 inches and 2.70¢ for wider than 16 inches; Steel Sheared Plates, 2.80¢. These prices may be shaded on exceptionally good orders. Beams and Channels, 3.20¢. From store quotations range from 1/16¢ to 1/8¢ advance on above prices.

**Plates, Tubes, &c.**—Trade from store is good on Plates, but business from mill is only fair. Large buyers, as a rule, will not be in the market until next month. Manufacturers' prices are apparently a little firmer than a week ago and they are less disposed to sell ahead. Dealers are of the opinion that there will not be a change until next month, when they look for an advance. Mill prices are as follows, f.o.b. Chicago: Tank Iron, 2.45¢; Tank Steel, 2.80¢; Iron Sheets, Nos. 10 to 14, 2.80¢; Steel do., 3¢. Immediate business in small lots is at the following quotations: Nos. 10 to 14 Iron Sheets, 2.90¢; No. 16 do., 3¢; No. 18, 3.25¢; Nos. 10 to 14 Steel Sheets, 3¢ @ 3.25¢; No. 16 do., 3.50¢ @ 3.75¢; No. 18 do., 3.75¢ @ 4¢; Tank Iron, 2.75¢ @ 2.80¢; Tank Steel, 3¢ @ 3.10¢; Shell Iron and Steel, 3.25¢; Flange Steel, 3.50¢; Fire-Box, 4.25¢ @ 5.50¢; Boiler Rivets, 4¢ @ 4.25¢; Norway Rivets, 40¢; Boiler Tubes, 1 1/4 inches and smaller, 45¢; 2 to 4 inch, 50¢; 4-inch and larger, 52 1/2¢.

**Sheet Iron.**—Mills report that they have a great many inquiries for Light Sheets. Prices are irregular, being governed by the amount of work manufacturers have on their books. For No. 27, 3.10¢, at mill, is a pretty general quotation, though it is rumored that 3.20¢ has been named by some of the manufacturers for Chicago delivery. From store small lots are 3.50¢.

**Galvanized Iron.**—Mill trade on standard grades is very good and prices firm; there is a perceptible weakness and some cutting on the cheaper grades of material both from mill and store. Small lots of Juniata brand are quoted at 60¢ off.

**Merchant Steel.**—Manufacturers' agents report an increased demand for low grade Open-Hearth Steels and profess their inability to get material to supply their customers. Tool Steels and Machinery Shapes are in better request for spring delivery by jobbers and retailers. The immediate demand for Plow and general Agricultural Shapes is greater than the mills can supply. Many consumers who placed their orders last fall are unable to get deliveries and are now seeking odd lots from other makers. Manufacturers' prices in carload lots are as follows, f.o.b. Chicago: Open-Hearth Machinery and Toe-Calk, 2.75¢ @ 2.85¢; Spring, 2.65¢ @ 2.90¢. The following quotations are made from store: Open-Hearth Machinery, Toe-Calk and Spring, 3¢ @ 3.25¢; Bessemer Bars, 2.50¢ rates; Tire, 2.50¢ @ 2.65¢; Tool, 7 1/4¢ and upward; Crucible Sheets, 7¢ @ 10¢.

**Steel Rails and Fastenings.**—Nothing of especial note has occurred in the demand for Steel Rails in the past week. Numerous orders for 1000 to 3000 tons were placed, and many inquiries for small lots for spring and summer delivery were made. The market has nevertheless weakened and prices now range from \$36.50 to \$37.50. Several orders for Splice Bars were placed at prices somewhat lower than previous quotations. Manufacturers are now quoting 1.85¢ @ 1.90¢ for Iron and 2¢ for Steel. The price on both Iron and Steel has become a trifle irregular from close competition on recent large and desirable orders. There are a number of important lots under negotiation, which may develop still lower prices, although the demand is increasing. Spikes are quoted at 2.25¢ @ 2.30¢; Square-Nut Bolts, 2.80¢ @ 2.85¢; Hexagon do., 2.95¢ @ 3¢.

**Old Rails and Wheels.**—There has been considerable activity in the Old-Rail market in the way of inquiries, but very few transactions have resulted. Prices appear to have a downward tendency. One lot of 500 tons changed hands at about \$24. On another lot of 3000 tons it is said that this price was refused. Old Steel Rails are in excellent demand and stocks scarce. Prices range from \$21 to \$21.50 for 3-foot lengths and over and \$20 to \$20.50 for lengths under 3 feet. There is very little doing in Old Car Wheels. Prices range from \$18.50 to \$19.50. There has been more inquiry for carload lots, with one sale of a round lot reported at a price above quotations.

**Scrap.**—Mixed Steel appears to be the only article in the Scrap line for which there is much demand. A sale of No. 1 Forge Iron is reported at \$18.75, net ton. No. 1 railroad Scrap is quoted at \$21. Dealers' quotations are as follows, per ton of 2000 lb: Fish Plates, \$22; No. 1 Mill, \$16; Old Axles, \$24; Pipes and Flues, \$14.50; Wrought Turnings, \$14, &c.

**General Hardware.**—Jobbers report an exceedingly good trade from the West and South. The aggregate business for January and February is estimated to be considerably greater than for the same months last year. Prices on shelf goods remain steady and firm, with indications that certain lines will be advanced by the time spring trade opens up. The present volume of business would be much greater if country roads were in better condition. The cold snap that has prevailed throughout the West in the last ten days is being felt by the retail merchants, and their orders to jobbers embrace larger assortments and a greater line of goods.

**Barb Wire.**—The market continues irregular and prices weak. There is a disposition on the part of some Eastern manufacturers who have large stocks to unload in this market, and in their effort to do so figures have been named to jobbers that are very much below previous quotations. Manufacturers in the West are disposed to hold their stock, and anticipate that they will have a stronger market in the next 30 days. Jobbers are quoting carloads of Painted Wire at 3.35¢, and 10¢ advance on these figures for small lots. The customary advance, 60¢ per 100 lb is quoted on Galvanized.

**Nails.**—The demand for Cut Steel Nails is only of a mediocre character. Jobbers are quoting \$2.45 in carload lots and \$2.50 in small lots, 2¢ off, 60 days. There appears to be a better demand for Wire Nails, and manufacturers are inclined to offer inducements to jobbers for large orders. Jobbers are quoting \$3.10 in carload lots, with 5¢ per keg added for lots less than carloads. These prices are by no means firm and in all probability could be shaded from 5¢ to 10¢ per keg on carload orders, straight or mixed, when accompanied by a desirable order for hardware merchandise.

**Pig Lead.**—Jobbers report a good inquiry, some 900 tons having changed hands at 3.67 1/4¢ @ 3.70¢, the latter figure being the market price at the close of the week. Stocks are reported light and many of the refiners out of the market.

Avery & West is the style of a new firm who have recently opened an office in room 457, Rookery Building, Chicago, for the sale of Railway Supplies, Pig Iron, &c. They have been appointed agents for Bouton & Co., of Aurora, Ill., manufacturers of Car-Wheels, and for the Reading Bolt and Nut Works, of Reading, Pa. They are also agents for one of the best grades of Salisbury Pig Iron, directly representing the manufacturers. The members of the firm are John H. Avery and Francis T. West.



## Philadelphia.

Office of *The Iron Age*, 220 South Fourth St.,  
PHILADELPHIA, Pa., March 4, 1890.

There is so little change in the market that it is impossible to define it correctly without reiterating the remarks of several preceding reports. Stocks are kept pretty well down, and although the buying movement is light, consumption is evidently very near to the maximum of the past 12 months. It is nevertheless true that the amount of orders on hand at the various mills is rapidly decreasing, so that there is corresponding anxiety to "catch on" to anything new that may be offered. Under these circumstances prices are all liable to be shaded more or less, according to what the order may be. Since the first of the year the decline in Pig Iron may be placed at an average of about 50¢ per ton, Muck Bars 50¢, Soft Steel Billets \$2, Bar Iron \$1, Plates and Angles \$2.50 @ \$3. At this decline there is still a good deal of hesitancy on the part of buyers, but if there is to be any such demand as the trade confidently expected some time ago prices must soon take another upward turn. There is no apparent reason why this should not be so. Prices went up too rapidly, and some of the boomers got left in waiting for still higher figures, but the general conditions, if not better, are certainly no worse than they were three or four months ago. The real trouble seems to have been that our large productive capacity was not fully taken into consideration. Tacitly every one assented to it, but when all that enormous output had to be marketed, and the speculative demand ceased, it is not surprising that a reaction came. The course of the market now turns entirely on the character of the demand in the near future. As we have already said, if the demand is to be such as the trade figured on last fall (and there is no apparent reason for its being otherwise) the market will not remain in its present condition much longer. There is a general impression that before the end of March the demand will be much heavier and with that a corresponding improvement in prices. Three or four weeks more will show whether these opinions are well founded or not.

**Pig Iron.**—The demand has not amounted to much of late and prices have gradually receded, especially on Mill Irons. Sales have been made at from \$17 to \$17.50, delivered, for good to choice brands, and prices seem likely to settle at about these figures. In some cases a little below \$17 has been accepted, but the terms of sale were somewhat exceptional; so that \$17 may be considered an inside figure for good Iron. Foundry Irons are relatively in a better position, \$20 @ \$20.50 being still obtainable for good to choice brands, although there is a great deal of Iron selling at \$19.50, delivered, and even this figure could be shaded for some brands. No. 2 sells at from \$18 to \$18.50, but there is no particular pressure beyond what is usual to retain trade on a weak market. The general opinion is that prices will remain at about these figures until heavy buyers have placed their orders, when a reaction toward higher prices is not improbable. Most if not all the leading furnaces are well sold up, but there are indications from outside sources of a desire to unload, and until this is accomplished here or elsewhere the market is likely to remain feverish and unsettled. It is still a waiting market, with the advantage slightly in buyers' favor, although quick changes may be expected if buyers show a disposition to load up with liberal quantities. At present it is a question of who speaks first, which, it is presumed, will indicate whose needs are the most pressing.

**Bessemer Pig.**—Small lots are selling at from \$21 to \$21.50 at furnace for low phosphorus Iron, but these figures could be liberally shaded on a firm offer for large lots. But there is no demand of that character, and as furnaces are sold a long way ahead, there is no urgency for new business.

**Ferromanganese.**—There have been a few sales of small lots, spot delivery, at about \$100 for 80 %, but lots for summer shipment have been secured at about \$85.

**Speiseleisen.**—There is no demand at the moment, although sellers quote \$35, duty paid, for 20 % at Atlantic ports. Buyers talk about \$34, although firm offers are not reported.

**Steel Rails.**—The market is very dull, although prices are fully maintained at \$35 at mill. It is said that a considerable amount of business must be placed within the next five or six weeks, and as mills have plenty of work to go on with it is claimed that there is no necessity for shading prices for business which in any event must be placed soon. A fair amount of orders is being taken from week to week, consisting mostly of lots of from 200 or 300 up to 500 tons each. These, with work on old contracts, keep the mills fully employed.

**Billets and Slabs.**—The market is very unsettled, and prices hardly quotable with strict accuracy. All depends on quantity, time and point for delivery, and similar considerations. Billets have been unsuccessfully offered at \$35 @ \$35.50, delivered, but there is reason to believe that the inside figure was shaded for one or two lots to mills near by. Nail Slabs are nominally \$33.50 @ \$34, delivered, but no business has been heard of for some time past.

**Blooms.**—Prices about \$52 @ \$53 "per Bloom ton" for Hot-Blast Charcoal, and \$54 @ \$55, delivered, for Cold-Blast. Runout Anthracite, \$44 @ \$45, and Scrap Blooms, \$35 @ \$36, delivered in consumers' yards.

**Muck Bars.**—There is very little doing, and prices are held with more firmness than seemed likely a week ago. One or two sales were made at \$31 @ \$31.50 at mill, and even the best buyers find it hard to do better than \$32, delivered; but a good many are inclined to wait for better terms, or better prices for their product.

**Bar Iron.**—There is no improvement in prices, but there is a little more inquiry, and manufacturers think that a fair amount of business will be distributed around shortly. At present there is no scarcity of work. The current demand for small lots in connection with old contracts keeps the mills fully employed, although they are all gradually finishing up their last fall's business, and are therefore anxious for renewals soon as possible. Under these conditions prices are irregular, nominally 1.95¢ @ 2¢ for Best Refined Iron, but 1.9¢ is not exceptional for the right kind of an order, and at country mills 1.82½¢ @ 1.85¢ is named for what is called first-class Iron.

**Skelp Iron.**—The market is not active by any means, although there are inquiries enough to make a considerable improvement, if they all go through. Prices are easier, however, and 1.90¢ @ 1.95¢ are the usual rates for Grooved, and 2.05¢ @ 2.10¢ for Sheared, but the amount of business closed is comparatively small.

**Plates.**—The market is somewhat more active, but the result of the week's business is not much beyond the week's production. Prices have been shaded, however, and it is impossible to secure orders of any importance without conceding something in sellers' favor. Mills are fully employed for the present, although orders do not extend very far ahead, so

that there is sharp competition for new business. Prices are quoted about as follows, delivered:

	Iron.	Steel.
Tank.....	2.25 @ 2.30¢	2.55¢ @ 2.65
Shell.....	2.50 @ 2.60¢	2.90¢ @ 3.10
Flange.....	3.25¢	3.10¢ @ 3.20
Fire-Box.....	3.75¢	3.75¢ @ 4.25

**Structural Material.**—There is no special change to note from last week. New business is not heavy, but the mills are pretty well employed for the present, with a fair probability of being able to maintain their position for some time to come. Prices are about as follows: 2.25¢ @ 2.30¢, delivered, for Iron Bridge Plate; 2.20¢ @ 2.30¢ for Angles, with 20¢ @ 25¢ more for the same in Steel. Tees, 2.8¢ @ 2.9¢; Beams and Channels, 3.1¢ for either Iron or Steel.

**Sheet Iron.**—The demand is unusually good for Sheet Iron, and mills are employed to their fullest capacity without accumulating much stock. Prices are firm for Black Sheets, although in some cases Galvanized is being cut, but as a rule prices are fully maintained, which for carload lots are about as follows:

Best Refined, Nos. 14 to 20.....	3.10¢
Best Refined, Nos. 21 to 24.....	3.30¢
Best Refined, Nos. 25 to 26.....	3.50¢
Best Refined, No. 27.....	3.60¢
Best Refined, No. 28.....	3.70¢
Common, ¼¢ less than the above.	
Best Soft Steel, Nos. 14 to 20.....	3.1¢
Best Soft Steel, Nos. 21 to 24.....	3.3¢
Best Soft Steel, Nos. 25 to 26.....	3.5¢
Best Soft Steel, No. 27.....	3.6¢
Best Bloom Sheets, 1-10¢ extra over the above prices.	
Best Bloom, Galvanized, discount.....	.60 %
Common, discount.....	.62½ %

**Old Rails.**—The market is dull, weak and lower. The only sale reported during the week was a 250-ton lot at a fraction less than \$25.50, ex-ship, Philadelphia, bids at about \$26 for lots delivered at mills at Harrisburg and vicinity. Holders ask \$26.50 for such deliveries, with no further bids or offers for lots in the city.

**Scrap Iron.**—Good No. 1 Scrap is not abundant, and prices for such are fairly maintained at about the following: No. 1 Wrought, \$24 @ \$24.50, Philadelphia, or for deliveries at mills in the interior \$24.50 @ \$25.50; \$16 @ \$17 for best Machinery Scrap, \$15 @ \$15.50 for ordinary, \$16.50 @ \$17 for Wrought Turnings, \$11 @ \$11.50 for Cast Borings, and \$28 @ \$30 for Old Fish-Plates, and \$18 @ \$19 for Old Car-Wheels.

**Nails.**—There is no material change in the Nail market, except that there is a trifle better demand. Prices remain at \$2.20 from store and from \$2 to \$2.10 for carload lots, according to delivery.

**Wrought-Iron Pipe.**—The demand is very satisfactory. Manufacturers say their sales during January and February were much larger than during the preceding year and outlook is decidedly favorable. Discounts unchanged, as follows: Butt-Welded Black, 47½ %; Butt-Welded Galvanized, 40 %; Lap-Welded Galvanized, 47½ %; Lap-Welded Black, 60 %; Boiler Tubes, 1½ inches and smaller, 45 %; Boiler Tubes, 2 to 4 inches, 50 %; Boiler Tubes, 4½ inches and larger, 52½ %; Oil Well Casing, 52½ %.

## Detroit.

WILLIAM F. JARVIS & Co., under date of March 3, 1890, say: The last week in February showed some good transactions on Lake Superior Charcoal Iron. A number of round lots, aggregating several thousand tons, were placed at ruling rates for delivery both prior to and after the opening of navigation. While some firmness was seen for this grade of metal, by the known refusal of an offer at a cut of \$1 per ton under the ruling rates, and while a state of activity can be reported among the Charcoal Iron men, with equal

truth may it be said that the transactions for Foundry grades of metal have been absolutely nothing. It would seem as if the next three weeks would tell the tale, and that upon the result of pressure to buy or sell the market will be more definitely established one way or the other. The market is quotable to-day as follows:

Lake Superior Charcoal, all numbers	\$22.50 @ \$23.50
Lake Superior Coke Bessemer	23.50 @ 24.50
Katahdin (Maine Charcoal)	23.00 @ 23.50
Lake Superior Coke Foundry, all ore	20.50 @ 21.50
Lake Superior Coke Foundry, cinder mixed	20.00 @ 20.50
Standard Ohio Blackband	21.00 @ 21.00
Southern No. 1	20.00 @ 21.00
Southern Gray Forge	18.00 @ 18.50
Jackson County (Ohio) Silvery	19.50 @ 20.00
Old Car-Wheels (nominal)	20.00 @ 21.00

## Cincinnati.

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, March 5, 1890.

(By Telegraph.)

The past week has been an exceptionally dull one in the local market for Pig Iron. The dullness, however, has not been associated with any special weakness, although a reduction of price was confidently expected by a few would-be buyers. Nor, on the other hand, has there been any display of strength beyond the maintenance of the position occupied by Southern furnaces for the past six weeks. During the past two weeks the course of events seemed to favor buyers strongly, and with the prospect of lower prices there has been no inducements to make purchases; in fact, even the inquiries have been light recently, it being the policy of consumers to let the market alone. There are few if any large buyers who are compelled to secure supplies at the moment, and even should they, by some unforeseen contingencies, be driven to purchase, it is reported here that some 8000 tons of Iron in second hands is available here at prices considerably under those demanded by furnaces. There is also reported to be about 10,000 tons in Louisville within the control of furnaces which is offered for sale. From the standpoint of the furnace, however, there is nothing to be gained by reducing prices. The largest stacks are reported to be in excellent shape, having very little surplus stock in yards and large orders ahead. It is reasoned that, although buyers are now well provided, consumption is fully as large, if not larger than several months ago, when heavy purchases were indulged in, and that within the next 60 days not a few large consumers must cover contracts, or at least buy from hand to mouth, and in the aggregate not of small proportions. The market seems to turn upon the financial standing of those interested, and which side proves to be the better equipped with funds will win. There is some uneasiness on the part of the smaller stacks which have followed in the wake of the larger furnaces, arising from the rumor that the large furnaces have been giving options and that the market will be dropped when plans are ripe, the contracts closed and the market restored to its old level, thus shutting out those without knowledge of the arrangements. A few furnaces not to be caught napping are taking orders at lower prices, but others have been reassured by the denial that any such scheme as that mentioned has been exercised and are disposed to show a bold front. The few sales reported, however, are on a lower level. 500 tons Virginia Gray Forge is reported to have been sold in Detroit, yesterday, on the basis of \$16.50 @ \$16.75, cash, Cincinnati. On the 15th inst. freight rates from Southern points to Cincinnati will be advanced 15¢. This will cut little figure in the market. Louisville has an advan-

tage of 35¢ over Cincinnati, which agents at that point are reported to be giving away and thereby securing some business, in which Cincinnati is handicapped. Quotations are without essential change, cash rates current at Cincinnati, f.o.b., being as follows:

Foundry.	
Southern Coke, No. 1	\$18.00 @ \$19.00
Southern Coke, No. 2	17.50 @ 18.50
Southern Coke, No. 3	17.00 @ 17.50
Ohio Soft Stone Coal, No. 1	18.50 @ 19.00
Ohio Soft Stone Coal, No. 2	17.50 @ 18.50
Mahoning and Shenango Valley	18.00 @ 18.50
Hanging Rock Charcoal, No. 1	21.00 @ 23.00
Hanging Rock Charcoal, No. 2	20.00 @ 22.00
Tennessee and Alabama Charcoal, No. 1	19.50 @ 20.00
Tennessee and Alabama Charcoal, No. 2	18.50 @ 19.00
Forge.	
Gray Forge	17.00 @ 17.50
Mottled Neutral Coke	16.50 @ 17.00
Car-Wheel and Malleable Irons.	
Southern Car-Wheel	23.00 @ 24.00
Hanging Rock, Cold Blast	22.00 @ 23.00
Lake Superior Car-Wheel and Malleable	23.00 @ 25.00

The capital stock of the Standard Pipe and Steel Works is \$500,000 paid in, with the possibility of an increase to \$1,000,000. Piqua has not been definitely decided upon, but a committee of officers and directors are making a tour of the natural gas section in view of a location. The Southern country will also be visited.

## St. Louis.

OFFICE OF *The Iron Age*, 214 N. Sixth st., St. LOUIS, March 3, 1890.

**Pig Iron.**—The report of one week ago is applicable to the present condition of things. There is a small amount of business being transacted, and inquiries are received that point to a renewal of activity before long. Foundry Irons are moving freely, and the demand for Car-Wheel Iron, which has been quite heavy since the beginning of the year, continues to be a feature. Consumers are pretty well filled up, and those whose stocks are light are only buying to fill immediate requirements, and are not disposed to purchase in such quantities as would keep them out of the market for any length of time. The market is in more or less of a chaotic condition, and it would be mere guesswork to attempt to anticipate the outcome of the next 30 days. Looking at the situation from the seller's standpoint, higher prices seem probable, as the disposition is to adhere firmly to prices as quoted herewith. Occasionally a sale is reported at figures a little less than those herewith quoted, but investigation generally proves it to be either a brand that is not quite up to the standard or comparatively unknown to the trade in this market. Looking at the situation from an unbiased view, the outlook seems somewhat improved. The following quotations show the basis on which sales are made:

Southern Coke, No. 1 Foundry	\$19.00 @ \$19.75
Southern Coke, No. 2 Foundry	18.50 @ 19.00
Southern Coke, No. 3 Foundry	18.00 @ 18.50
Gray Forge	17.50 @ 18.00
Ohio Softeners	20.50 @ 21.00
Lake Superior Charcoal	24.00 @ 24.50

Missouri.	
Charcoal Foundry, No. 1	21.00 @ 21.50
Charcoal Foundry, No. 2	20.00 @ 20.50

Tennessee.	
Charcoal Foundry, No. 1	20.00 @ 20.50
Charcoal Foundry, No. 2	19.75 @ 20.25

Connellsville Coke, f.o.b. East St. Louis. \$5.65; St. Louis, \$5.80.

**Bar Iron.**—No change to report either in regard to price or demand, both of which are quite satisfactory to all concerned. Lots from mill command 2¢. Small lots from store from 2.15¢ to 2.20¢.

**Barb Wire.**—The extremely low freight rate of 16¢ per cwt. from this city to Texas points continues to be in force and will be until 15th inst., on which date it will be

advanced to 70¢ per cwt. The result of this cutting of rates has been to flood every mill in this vicinity with all the business they can handle. The outlook for April trade in the section referred to is dubious, and mills will be compelled to seek other markets to sell their product, as it is generally believed that there has been enough Wire sold in Texas to last consumers for the next six months. Prices are being fairly well maintained as follows: Painted, 3.45¢; Galvanized, 4.05¢; Car-load lots, 10¢ per cwt. less than above prices.

## Cleveland.

CLEVELAND, March 3, 1890.

**Iron Ore.**—The market is not active, although prices appear to be firm enough. It is estimated in Ore circles that 4,750,000 tons of Bessemer and 2,500,000 tons of non-Bessemer Ore have been sold. The navigation season will open unusually early, passenger steamers having already commenced running between Cleveland and Detroit. Following are this week's quotations, f.o.b. vessels Cleveland:

No. 1 Specular and Magnetic Bessemer Ores, Bessemer quality	\$6.50 @ \$7.25
No. 1 Specular and Magnetic Ores, Non-Bessemer quality	5.50 @ 6.25
Red Hematite Ores, Bessemer quality	@ 6.00
Red Hematite Ores, Non-Bessemer quality	4.50 @ 5.00
Menominee Range Ores, Bessemer quality	5.50 @ 6.25
Menominee Range Ores, Non-Bessemer quality	4.25 @ 5.00
Gogebic Range Ores, Bessemer quality	5.25 @ 6.25

**Pig Iron.**—The furnacemen seem just at present to be too much engrossed in the work of filling orders taken two or three months ago to give much attention to the market fluctuations. Additional sales of No. 1 Foundry at \$19.80, cash, at the furnace, have occurred, but the amount of Iron involved has been small. Prices have changed but slightly during the past week, cash quotations being now as follows:

Nos. 1 to 6 Lake Superior Charcoal	\$23.50 @ \$23.50
No. 1, 2 and 3 Bessemer, ½ ton	@ 23.00
No. 1 Strong Foundry, ½ ton	19.30 @ 20.30
No. 2 Strong Foundry, ½ ton	19.30 @ 19.30
No. 1 American Scotch, ½ ton	19.30 @ 20.30
No. 2 American Scotch, ½ ton	18.30 @ 19.30
No. 1 Soft Silvery, ½ ton	18.00 @ 19.00
Mahoning and Shenango Valley Neutral Mill Irons, ½ ton	17.30 @ 17.80
Mahoning and Shenango Valley Red Short Mill, ½ ton	18.30 @ 18.80

**Old Rails.**—There is a somewhat improved demand for old Americans as prices gradually decline.

**Nails.**—Steel Wire Nails have been reduced from \$3.10 to \$3; Steel Cut Nails from \$2.60 to \$2.50, and Steel Spikes from \$2.85 to \$2.75.

**Manufactured Iron.**—Common Bar, at 1.85¢ @ 1.90¢, is in fair demand, while Sheets are still difficult to obtain at any price.

## Chattanooga.

Office of *The Iron Age*, Carter and 9th Sts., CHATTANOOGA, March 3, 1890.

**Pig Iron.**—The condition of the market remains about the same, both in price and demand. The producers are maintaining a very firm position in regard to price, and are getting it to the extent of their output for some time ahead. Several contracts have been made for deliveries up to July 1 and some beyond. During the past ten days these sales aggregate something over 60,000 tons, which will take a large share of their output. It has been rumored that some warrant holders have made disposition of their holdings at lower figures than the ruling furnace prices, which is probably so. In the present condition of the market there is little object gained in any furnace putting any of their



Iron into warrants, and, on the other hand, investing in them does not seem to be desirable from the present outlook. The general opinion appears to prevail that the market will remain in its present condition for some months to come—that is, a steady price on a basis of \$16 for No. 1 Foundry at the furnace bank. Stocks have been decreasing gradually, and they are much lighter than they were six months ago, both in warrant and furnace yards.

## Louisville.

LOUISVILLE, KY., March 3, 1890.

**Pig Iron.**—The market remains very quiet. Some slight concessions are being made and buying has increased. More parties are in the market than have been for some time. Most of the leading Southern furnaces are holding firm to prices that were given out about January 1, and so far have not thought it to their interest to make any change. Prices are nominally the same as last week, and represent the views of furnace men as a rule:

Southern Coke, No. 1 Foundry (new classification) .....	\$18.75 @ \$19.25
Southern Coke, No. 2 Foundry (new classification) .....	18.25 @ 18.75
Southern Coke, No. 3 Foundry (new classification) .....	17.75 @ 18.25
Gray Forge .....	17.35 @ 17.75
White and Mottled, different grades .....	16.00 @ 17.00
Silver Gray, different grades .....	16.75 @ 17.75
Southern Charcoal, No. 1 Foundry .....	18.75 @ 19.75
Southern Charcoal, No. 1 Mill .....	17.50 @ 18.00
Southern Car-Wheel, standard brands .....	23.50 @ 24.50
Southern Car-Wheel, other brands .....	19.25 @ 21.75
Hanging Rock Coke, No. 1 Foundry .....	18.75 @ 19.25
Hanging Rock Charcoal, No. 1 Foundry .....	22.00 @ 22.50
Hanging Rock, Cold Blast .....	24.00 @ 26.00

## Pittsburgh.

Office of The Iron Age, Hamilton Building, Pittsburgh, March 4, 1890.

There has been no very important change in the general Iron and Steel situation during the past week. New business continues comparatively light, and until the present feeling of uncertainty gives way to something better there is not likely to be any substantial improvement. The bad roads have had a good deal to do with the falling off in the demand for all Iron and Steel products. Good weather would do much toward bringing about a general improvement in business, more, probably, than all other causes combined.

**Pig Iron.**—The general position of the market does not differ much from what it was a week ago. Demand is still of a hand-to-mouth character, and those consumers still having stock bought some time ago are not buying a ton; they are determined to use up what they have before making additional contracts. Those consumers who are compelled to buy are buying from week to week. Moreover, no improvement in demand can reasonably be expected while the market remains in its present unsettled condition; consumers will not buy beyond their immediate requirements as long as there is the least probability of lower prices. However, there appears to be little or no abatement in consumption, and stocks in hands of consumers are steadily being reduced; hence there is a possibility of the market taking a turn in the opposite direction. Even now, if some of the large consumers were to make a few large purchases, there is every reason to believe that others would soon follow. The market here often takes a very sudden turn and is liable to do so now almost any day. Consumers who are now refusing to buy a ton more than they can help may in a week or two from now be glad to buy at an advance of 50¢ or \$1 a ton. Even now there is not much Iron offering; many of the furnaces here and at points tributary to this market are still working on contracts made some

time ago, when prices were much better than they are at present. Quotations may freely be given as follows:

Neutral Gray Forge .....	\$17.00 @ \$17.75, cash.
All Ore Mill .....	18.50 @ 19.00, "
White and Mottled .....	16.25 @ 16.75, "
No. 1 Foundry .....	19.50 @ 20.00, "
No. 2 Foundry .....	18.50 @ 19.00, "
No. 1 Charcoal Foundry .....	24.00 @ 25.00, "
No. 2 Charcoal Foundry .....	22.50 @ 23.00, "
Bessemer Iron .....	21.00 @ 21.50, "

In regard to Bessemer there have been no sales reported for a couple of weeks or more; it is being offered at \$21.50, cash, and there is reason to believe that an offer of \$21 would be accepted. As compared with the highest point Bessemer is off \$3 @ \$3.50 per ton, and Forge Irons about \$1. The former advanced a good deal more than the latter, hence there has been a corresponding decline.

**Muck Bar.**—There is no improvement in demand and prices continue weak. We now quote at \$29 @ \$30, with little or no inquiry that we can hear of. However, there will, no doubt, be an increased demand as the season becomes more advanced, and some sellers refuse to sell at prices quoted.

**Manganese.**—We can report sales of Domestic 80 % Ferromanganese at \$97 @ \$98, cash, for delivery this month and next. Foreign is being sold at all kinds of prices, depending largely upon delivery.

**Manufactured Iron.**—Business is only fair and prices are weaker, in sympathy with the raw material. As stated in our last report, demand is always curtailed when the market is in its present unsettled condition, with prices weak and tendency downward, but a turn in the opposite direction would cause a largely increased demand. We now quote Bars 1.85¢ @ 1.90¢; Plates, 2.35¢ @ 2.40¢; No. 24 Sheet, 3¢ @ 3.10¢; Skelp, 1.85¢ @ 1.90¢ for Grooved and 2.10¢ @ 2.15¢ for Sheared, all 60 days, 2 % off for cash.

**Structural Iron.**—There was a meeting of the Structural Iron manufacturers in this city last week; good attendance, and nearly if not all in attendance reported the outlook very encouraging for an active trade this year; also, that there is now a good deal of inquiry which, it is believed, will lead to considerable business later on. Tees and Universal Mill Plates are a shade lower, the rest of the list remains unchanged: Angles, 2.35¢; Tees, 2.80¢; Channels, 3.10¢; Sheared Bridge Plates, 2.80¢; Universal Mill Plates, 2.80¢.

**Nails.**—The nail trade continues slow, but an improved demand is looked for within a week or two, as it usually commences to look up this month. No change in prices; Cut Nails \$2.35, 60 days, 2 % off for cash, in carloads and \$2.35 in less than a carload. Wire Nails remain unchanged at \$2.80 rates in car lots, 60 days, 2 % off for cash.

**Wrought-Iron Pipe.**—At the regular monthly meeting of the association, in Philadelphia last Wednesday, the only change made in prices was to advance Casing slightly. There is a very fair business—all that can be expected in view of so much bad weather and almost impassable roads. The work of putting down gas and oil wells has been very much curtailed all winter by the fact that it was almost impossible to get the necessary machinery for the same transported, and then it is very expensive, as it requires six horses to haul an ordinary load. There is not the demand for Pipe Casing and all kinds of Gas and Well Supplies that there would be otherwise. Discounts on Black Butt-Welded Pipe, 47½ %; on Galvanized do., 40 %; on Black Lap Welded, 60 %; on Galvanized do., 57½ %. Boiler Tubes, 1½-inch and smaller 45 %, 2 to 4-inch 50 %, 4-inch and larger 52½ %. Discount on Casing has been reduced from 52½ to 50 %.

**Steel Plates.**—There is a continued good demand, but prices continue offish, and as will be noted we have again reduced our quotations slightly. Fire Box, 4½¢ @ 4½¢; Flange, 3.35¢; Shell, 3.15¢; Tank, 2.75¢.

**Merchant Steel.**—There has been no change in prices the past week, but the feeling is offish and buyers have the advantage. Tool Steel, 8¢ per lb and upward; Crucible Spring Steel, 4¢; Open-Hearth, base sizes, 2½¢ @ 3¢; Bessemer Machinery, 2½¢; Tire Steel, 2.65¢.

**Old Rails.**—There appears to be no demand whatever in the market, and not much elsewhere; prices continue weak and drooping. One of our brokers reports a sale of 500 tons delivered at Youngstown at \$26, whereas the same broker sold for same delivery the week before at \$27. As noted in a former report, the low price of Muck Bar is hurting the market for Old Rails. Old Steel Rails are less active and weaker. We now quote at \$22.50 @ \$23.

**Billets, Blooms, &c.**—The market for Bessemer Steel Billets continues somewhat demoralized and during the week under review there has been a still further decline. We now quote at \$33 @ \$33.50, with rumor of a sale having been made at a fraction less than the inside quotation. Nail Slabs about the same as Billets. The latter have declined as compared with the highest point from \$3 to \$3.50 per ton, and there is no assurance as yet that hard pan has been reached.

**Steel Rails.**—Some small sales have been made during the week at \$35, cash, at mill, but it is intimated that a desirable order could be placed below the price quoted. The mills not only here but elsewhere appear to be anxious for business.

**Railway Track Supplies.**—The demand for everything in this line continues lighter business expected to improve within the next few weeks. No change in prices, although they are weaker, and for desirable orders might be cut. Spikes are still quoted at \$2.15, 30 days, on cars at works here, and \$2.25 delivered at Chicago and St. Louis.

**Old Material.**—The demand for everything in this line continues light and prices are weak and drooping; sales No. 1 Wrought Scrap, at \$22 @ 22.50, net ton; Car Axles at \$28 @ 29; Cast Scrap at \$15.50 @ \$16, gross, and Old Car-Wheels at \$20 @ \$21; Steel Bloom and Rail Ends at \$24 @ \$24.50, gross.

## New York.

Office of The Iron Age, 65 and 68 Duane street, New York, March 5, 1890.

In every department of the Iron and Steel trades the one general feature is the desire of buyers to wait before purchasing. Unless they actually need material for immediate requirements they cannot be tempted by offers, fearing and believing that the tendency is downward and that what seems cheap to-day may be dear a few weeks hence. This attitude is surprisingly general and in it lies some danger to the market, since when the turn does come it is likely to come with a rush.

**American Pig.**—Taken as a whole, the market is flat, with very little business being transacted. Foundries generally are reported to be very well covered for a considerable time to come, so that consumers seem to have the better of it in their facility to await developments. Outside lots are offered at low prices, small parcels of No. 1 having gone shopping at \$18.50. The Birmingham *triumvirate* is reported to be still intact, so that no open cutting of agreed prices in that quarter for Western markets has yet taken place. We quote No. 1 Foundry

\$19.25 @ \$20, No. 2 Foundry \$18.25 @ \$18.50 and Gray Forge \$17 @ \$18, at tide-water.

**Spiegeleisen and Ferromanganese.**—There is complete stagnation in the market for Manganiferous material, so that values are entirely nominal. We quote 20 % Spiegeleisen \$35 @ \$35.50, and Ferromanganese \$85 @ \$90, according to time of delivery.

**Wire Rods.**—There is increasing pressure to sell, so that quotations in the West have receded to \$49 @ \$49.50, which would be equivalent to about \$53 @ \$53.50 at tidewater.

**Steel Rails.**—Some sales have been made in this vicinity and in New England, aggregating about 7000 tons. Besides, a number of small blocks have been placed South and West. There is a keen competition both East and West, to judge from the reports of the Eastern mills on the Western market and the talk of the Western agents of the doings of the Eastern mills. The market is weaker in both sections, and a good round order, for desirable delivery, would tempt some of the mills to make close prices. We quote nominally at Eastern mills \$34.50 @ \$35, with the same quotations for the Pittsburgh district.

**Track Material.**—The market is weaker, with some sales in this vicinity. We quote Spikes, 2.15¢ @ 2.25¢; Angles, 2.10¢ @ 2.15¢; Bolts and Hexagon Nuts, 3.20¢ @ 3.25¢ and Bolts and Square Nuts, 3.10¢, delivered.

**Structural Iron.**—Only details were discussed at the meeting of Beam Manufacturers at Pittsburgh last week, no change being made in prices. We understand that the total production of Beams by the domestic mills in 1889 was 101,000 tons. This clearly indicates how largely the demand for Structural Iron has developed. The market now is quiet, with no transactions of any consequence closed in this section. We quote on Iron Universal Mill Plates, 2.2¢ to 2.25¢; on Angles, from 2.20¢ to 2.30¢; on Tees, from 2.60¢ to 2.70¢ and on Beams and Channels, 3.10¢ on dock. In Plates we note a sale of a moderate lot of Marine Steel at 3.20¢, delivered.

**Old Rails.**—Among the recent sales were three lots from a trunk line aggregating 4000 tons at private terms, chiefly for Western delivery. The market is dull, with some pressure to sell and little demand. We quote nominally \$25 @ \$25.50 for Domestic Tees.

## Financial.

The advent of spring, although accompanied with a reminder of the blizzard of 1888, brings a more cheerful tone. The uncertain monetary outlook still operates as a check to speculators and conveys an admonition in various directions. At the same time the state of trade generally is encouraging. Merchants from the South and Southwest, whence the spring movement naturally starts, are already well represented in the New York markets. The eastward movement of freight from Chicago is unparalleled for this season of the year, the tonnage by the trunk lines amounting to 106,000 tons, against 65,300 for the same week in 1889. Shipments from New York by the ocean steamers have also taken a good start, with engagements of considerable magnitude extending through the spring months. Labor is not altogether at rest. The first of the building trades in New York to secure an eight-hour work-day is the plasterers, their agreement being for \$4 per diem. In the New England States labor troubles have ceased, excepting in Nashua. The latest reported is an

ironworker's strike in San Francisco. The announcement by the Pennsylvania Railroad Company that the Delaware and Raritan Canal will not open until April 1, notwithstanding the pressure of freight, causes much disappointment.

The stock market was irregular and lower, influenced by an uncertain money market and the absence of investors. Tennessee Coal and Iron and Colorado Coal and Iron were both prominent features on Friday. Favorable reports concerning the latter were current, but were received with caution. The announcement that the Iowa Railroad Commissioners refused to reduce rates was received with satisfaction. On Saturday the only notable fluctuations were sharp advances in Tennessee Coal and Iron and in Sugar Refineries stock. The first named was favorably affected by the discontinuance of the suit recently instituted by the management of the company against Ex-President Inman and his associates. On Monday the stock market was virtually left to the professional traders. On Tuesday the market was inactive and strong. An advance of 1¢ 3/4 pound in sterling had no effect.

United States bonds were strong, the 4s closing 1/8 % higher bid. Quotations are:

U. S. 4s, 1891, registered...	103 1/4
U. S. 4s, 1891, coupon...	103 1/4
U. S. 4s, 1907, registered...	121 1/4
U. S. 4s, 1907, coupon...	121 1/4
U. S. currency 6s, 1895...	116

Exports of merchandise from New York for the week are \$7,895,700; imports, \$6,972,500. It is reported in London that \$280,000 in gold has been shipped from Holland to New York. From Dover \$400,000 arrived.

In the merchandise markets there is some slight improvement, particularly in bread-stuffs, exporters showing more animation. Mediterranean countries have been taking considerable wheat and corn is in more request. The export demand for March and April shipments is most noticeable. Rains in California, we are told, will give the State "the greatest wheat crop ever known." Spot in New York is up 1¢. Better prices are realized for sugar and coffee. Rubber has advanced materially with an active demand, sales having been made at 80¢ 3/4 lb; coarse spot, 58¢. A manufacturer is said to have bought in this market 1,000,000 lb, all that could be obtained. Provisions are steady. In dry goods there is an active jobbing trade. A considerable number of Western and Southern buyers are present. The business of February equals last year's proportions.

The weekly bank statement made a better showing than was generally expected, the loss in reserve being \$1,336,000, and reducing the surplus to \$2,364,200 above legal requirements. The decrease was due to the continued absorption of money by the Government. For the first time in over a month loans show a contraction, the decrease amounting to \$4,853,100. Specie and legal tenders combined decreased \$3,613,100, while the deposit line fell off \$9,118,000. Money on call averaged about 5 per cent., and came chiefly from private sources, few banks being in a position to accommodate. Time money is 5 1/4 % for 60 days and 5 % for six months on prime collateral security. Commercial paper quiet. The best double-name paper is quoted at 5 1/2 @ 6 %, and prime single name at 6 @ 7 %. The interest and dividend payments due March 1 were estimated at \$17,607,377, against \$16,936,203 last year. Mr. Leland's successor as president of the Sixth National Bank is Alexander H. Stevens, vice-president of the Gallatin National Bank. Stock for which Classon, Simmons & Co. paid \$650 per share now sells on a basis of \$330 per share.

Sterling exchange was active and lower, dropping to \$4.81 @ \$4.85, posted rates influenced by offerings of bills against securities bought on European account, fa-

vorable trade conditions and active money. In case of stringency gold importations are not improbable. In London bar silver advanced from 44 1/4 d to 44 3/4 d 3/4 ounce. Silver certificates here were also stronger. The steady advance is ascribed to the demand from India, which raises the price in London and sympathetically here.

A statement prepared at the Treasury Department shows that there has been a net decrease of \$10,276,963 in circulation since February 1, and a net increase of \$6,901,968 in money and bullion in the Treasury during the same period. There was an increase in circulation of nearly \$3,000,000 in silver certificates and a decrease of \$8,000,000 in gold certificates. The total debt, less cash in the Treasury, was reduced \$8,159,487, and the reduction since June 30, 1889, has been \$42,099,092.

The contraction in the amount of national bank circulation in the twelve months has been \$32,098,219; the amount of lawful money held for the surrender of national bank notes in the same period was reduced \$18,633,955.

The suit brought by the Tennessee Coal, Iron and Railroad Company against John H. Inman, as fiscal agent, to recover \$2,500,000, alleged to have been wrongfully appropriated, was discontinued by mutual agreement.

The Chicago Board of Trade, disgusted with the result of its long fight against bucket shops, both in and out of the courts, has resolved to discontinue its market reports altogether.

The Pan-American Conference has adopted the report of the Committee on Patents and Trade-Marks, recommending that all American nations abide by the Montevideo Congress to protect inventors, authors and manufacturers.

## Metal Market.

**Copper.**—A week since the London quotation was £47. 2/6, spot, and £47. 15/ futures; it is to-day respectively £46. 17/6 and 47. 10/, sales during the interval summing up 2710 tons. Here a good demand has prevailed for Lake Wire Bars at 14 1/4¢ @ 14 1/2¢, Lake selling selling at 14 1/4¢ @ 14 1/2¢, and casting brands at 12 1/4¢ @ 12 1/2¢, while Arizona is worth 13¢. Messrs. James Lewis & Son, Liverpool, write in their circular of February 17: "Furnace Material is very scarce, and commands very high prices compared with Chili Bars, especially in view of the increased cost of smelting caused by the great increase in the cost of fuel. Montana Matte has sold at 10/ per unit for ordinary quality, and about the equivalent of this for the Argentiniferous quality, of which the supply now chiefly consists, owing to the stoppage of supplies due to the fire in the Anaconda and St. Lawrence mines. It is a matter of some surprise that the French holders do not realize part of their large stock of Anaconda Matte—23,600 tons—in preference to selling Chili Bars, as part of this could probably be sold to smelters without detriment to the general market." The import into Liverpool and Swansea during January of American Copper has been 2951 tons Fine, against 4576 in 1889, and 3985 in 1888. The visible supply of Copper in England and France March 1 was 95,150 tons, against 118,150 tons on March 1, 1889.

**Tin.**—At the time of our last week's report the quotation in London for spot was £89. 15/, and for futures £90. 12/6; it is respectively to-day £90 and £91, sales meanwhile aggregating 1670 tons. In sympathy with the continual fluctuations in London, our market has been irregular, and at one time gave way to 20.40¢ spot, but it soon recovered tone, and spot commands 20 1/2¢ @ 20 3/4¢ to-day, with futures in proportion. Sales in New York for the week, 350 tons, including 10 tons March



to-day at 20.35¢. Visible supply of Tin March 1, 14,703 tons, against 15,071 February 1 and 14,923 March 1, 1889. *Tin Plates*.—No business of any importance has transpired during the week. The large consumers are holding off for still lower prices, there being from 15¢ to 25¢ per box difference between their views and those of sellers, although the latter are disposed to discount English prices. However, during the next four or six weeks considerable business is likely to be transacted. We quote at the close, per box: Siemens-Martin Steel, Charcoal finish, \$5.50 @ \$6; Coke finish, \$5.10 @ \$5.25; Coke Tins, Penlan grade, \$4.50 @ \$4.55; J. B. grade, \$4.75 @ \$4.85, and Wasters, \$4.40.

**Lead**.—Prices have been hardening, less from any increase in the consumptive demand than from an absence of sellers, since the refiners—by virtue of the association scheme they have—do not offer a pound of Lead pending further developments. Sales in the open market did not exceed 200 tons, at 3.85¢, 3.87½¢ and 3.90¢, the closing figures being 3.90¢ @ 3.95¢. St. Louis and Chicago advanced to 3 70¢ and are very firm thereat.

**Spelter**.—Common Domestic is still in a poor plight; the few purchasers do not offer over 5¢, while holders ask 5.20¢, so that the market may be called 5½¢, nominally. Silesian gave way in London from £22. 10/ to £22. 2/6, and the nominal quotation here is 7¢.

**Antimony**.—A fair jobbing demand is noticeable at 29¢ Cookson's and 20½¢ Hallitt's.

#### New York Metal Exchange.

The following sales are reported:

THURSDAY, February 27.	
10 tons Tin, spot.....	20.40¢
30 tons Tin, April.....	19.95¢
20 tons Tin, spot.....	20.45¢
FRIDAY, February 28.	
10 tons Tin, spot.....	20.70¢
MONDAY, March 3.	
60 tons Tin, March.....	20.60¢
50 tons Tin, April.....	20.35¢
35 tons Tin, April.....	20.35¢
10 tons Tin, spot.....	20.90¢
10 tons Tin, spot.....	20.85¢
10 tons Tin, March.....	20.45¢
30 tons Tin, May.....	20.25¢
10 tons Tin, May.....	20.20¢
16 tons Lead, April.....	3.90¢
TUESDAY, March 4.	
10 tons Tin, spot.....	20.70¢

#### Coal Market.

"For Anthracite Coal there is absolutely no market; if a man comes in to buy we don't let him go out." So remarked a prominent representative of one of the large Coal properties yesterday. Prices in a general way may be marked at least 50¢ off from the schedule. An important factor in the Coal trade now being felt for the first time is the course of the Eastern trade through Newburg and via the Poughkeepsie bridge by the all-rail routes. Prices are made at either of those points at the convenience of the purchaser, which means a further cut below the 25¢ reduction at the mines announced last week. That is, mine prices are now about \$2.25 per ton, equal to a cut of 40¢ a ton on Stove. All the companies—the Lehigh Valley, the Coal and Navigation Company, the Pennsylvania Coal, &c.—doing their Eastern business in the way above indicated. Anthracite prices at the mines are: Broken, \$2.25; Egg, \$2.20; Stove, \$2.40. The official statement for the week ending February 22 is as follows:

Regions.	1890.	1889.	Difference.
Wyoming.....	230,890	286,571	55,591
Lehigh.....	78,222	94,687	16,465
Schuylkill.....	106,641	119,444	12,803
Totals.....	415,843	500,702	84,859
Total for yr.			
to date.....	3,793,280	4,298,650	505,370

The recent action of the Coal sales agents in Philadelphia is referred to by the *Ledger* as follows, and is certified to in New York as being a correct statement: "While the new prices are 10¢ to 25¢ per ton lower than their previous public prices, the individual operators have been underselling the reduced figures from 10¢ to 25¢ additional per ton. At New York Harbor excellent Free-Burning Chestnut Coal is selling at \$3 per ton, f.o.b., and Beaver Meadow and other Coals of equally good quality are selling at \$3.50, f.o.b., for Egg and Stove sizes."

The net earnings of the Pennsylvania Railroad's Coal companies for 1889 showed a decrease of \$787,276, as compared with 1888, on 2,418,180 tons of Coal mined. The average receipts for this Coal at point of sale fell from \$3.59 in 1888 to \$3.32 in 1889.

A disastrous fire at the Cameron Mine, in Wilkesbarre, is beyond control. Eight lives were lost.

The surveying party sent out by the Denver, Colorado and Pacific Railroad Company, in charge of Colonel Staunton, report finding pure Anthracite Coal equal to that of Pennsylvania.

Coal was never so high or scarce in Great Britain and on the Continent of Europe as it is now. The price of Coal and Coke has advanced in England from 60 to 100 % within the past year. A cargo of Coal was shipped recently from Philadelphia to France.

It is authoritatively announced that after negotiations extending over several months, the proposed Bituminous Coal Trust, through which all of the competitive Bituminous tonnage was to be sold, has been abandoned. The chief obstacle to the organization of the trust was the opposition of a number of small producers. Quotations for Bituminous are \$3.25 f.o.b., in New York, and \$2.60 at Baltimore, Philadelphia and other shipping points.

#### Imports.

##### Hardware, Machinery, &c.

Bucks, H. & Co., Chains, cks., 2  
Baker, Hermann & Co., guns, cases, 24  
D. L. & W. Railway, Mach'y and Wire, cs., 14  
Field, Alfred & Co., Arms, cs., 8  
Freese, Peter & Co., Mds., cs., 2  
Folsom Arms Co., H. & D., Arms, cases, 7  
Hartley & Graham, Arms, cs., 21  
James E., Mach'y, cs., 75  
King, Ezekiah, Hardware, pgs., 15  
Morton, Andrew, Mach'y, cs., 2  
Oestel, C., Mach'y, pcs., 1  
Roessler & Hasselcker, Nails, kgs., 105  
Shoverling, Daly & Sales, Guns, cs., 5  
Sheldon, Geo. W. & Co., Guns, cs., 4  
Sumner, C. P. & Co., Mach'y, cs., 31  
Werlemann, H. & Co., Guns, cs., 27  
Wiebusch & Hilger, Arms, cs., 19  
Witte, John G. & Bro., Mds., cs., 3  
Order—Machinery, cs., 50; cooking pots, 132; Hardware, cs., 2

#### British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]

LONDON, WEDNESDAY, March 5, 1890.

During the latter part of last week there was a fair trade in Pig Iron, but since then the market has been dull and prices have shown a downward tendency. A meeting has been held of Hematite makers, at which it was agreed to damp furnaces down in order to bring the position into better shape. Another meeting will be held shortly to decide upon the conditions and the quantity of Iron to be produced.

Tin Plate has continued in limited demand, and prices are still unsettled, with as low as 14/6 said to have been accepted for Bessemer from second hands.

The Morewood, Cwmbwrla and South Wales works, owners of the B. N. brand, have had a private meeting, at which it was resolved not to stop work, as they have orders enough on hand to last six months. Western works will not stop either. Notice has been posted in the Melingriffiths works that contracts terminate a week from Saturday. The works are not fully booked and are therefore willing to combine with others to shut down.

For Copper the demand has been small, but several lots of Bars changed hands at about £47. Speculation has been inactive. Holders of American Matte continue very firm in their views and expect a large demand, as smelters have bought comparatively little since November last. Recent sales have been chiefly to Sulphate Copper manufacturers. Transactions during the past fortnight include 400 tons Anaconda Matte at 10/3 and 40 tons Montana Matte at 10/, to arrive, in Liverpool.

Block Tin has improved and quite a large business was done at £90. 5/ spot. Outside speculation, however, is rather dull.

It is reported that German Galvanized Sheet-Iron makers are forming a syndicate. Belgian Iron makers have taken united action to maintain prices and the movement has resulted in a more active demand springing up. The French market is quieter, with a slight giving away in prices, although efforts are made to uphold late rates.

**Scotch Pig**.—Prices for nearly all brands are lower, and business is rather dull at the decline:

No. 1 Coltness, f.o.b. Glasgow.....	76/6
No. 1 Summerlee, " ".....	72/
No. 1 Gartsherrie, " ".....	72/
No. 1 Langloan, " ".....	71/6
No. 1 Carnbroe, " ".....	53/6
No. 1 Shotts, " at Leith.....	54/6
No. 1 Glengarnock, " Ardrossan.....	73/
No. 1 Dalmellington, " ".....	61/
No. 1 Eglinton, " ".....	54/
Steamer freights, Glasgow to New York, 2/; Liverpool to New York, 10/.	

**Cleveland Pig**.—Very little business doing, and prices still irregular and weak. No. 3 Middlesborough quoted at 51/9, f.o.b.

**Bessemer Pig**.—Sales are moderate and the market still unsettled.

**Spiegeleisen**.—There is less doing, but makers remain firm at previous prices. English 20 % quoted at 130/, f.o.b. at works.

**Steel Rails**.—Sellers are offering at 10/ decline, but business is slow and the demand moderate. Heavy sections quoted at £6. 12/6 and light sections £7. 2/6 @ £7. 10/, f.o.b. at N. W. England shipping point.

**Steel Blooms**.—Demand has fallen off and prices are weaker. We quote £6. 15/ for 7 x 7, f.o.b. at N. W. England shipping point.

**Steel Billets**.—The demand is running slow and business has been done at a decline. Bessemer, 2½ x 2½ inch, £6. 15/, f.o.b. at N. W. England shipping point.

**Steel Slabs**.—The market rather dull and prices are weaker. Bessemer, £6. 15/, f.o.b. at N. W. England shipping point.

**Old Rails**.—There is very little doing and some holders offer at lower prices.

Tees quoted at £3. 10/, and Double-Heads, £3. 12/6, f.o.b.

**Scrap Iron.**—Demand has continued slow and prices are still in buyers' favor. Heavy Wrought quoted £3. 5/.

**Crop Ends.**—Business moderate and prices nominal. Bessemer quoted £3. 5/, f.o.b.

**Tin Plate.**—The market very quiet and prices irregular. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade.....17/6 @—  
IC Bessemer Steel, Coke finish.....15/ @ 16/  
IC Siemens.....15/6 @ 16/3  
IC Coke, B. V. grade.....15/ @ 15/6  
Charcoal Terne, Dean grade.....14/6 @—

**Manufactured Iron.**—Transactions have been moderate in this line, but prices are without radical change. We quote, f.o.b. Liverpool:

	£	s.	d.	£	s.	d.
Staff. Marked Bars.....	10	0	0	@	0	0
" Common "	9	0	0	@	9	5
Staff. Bl'k Sheet, singles.....	11	0	0	@	11	5
Welsh Bars (f.o.b. Wales)...	7	12	6	@	0	0

**Tin.**—The market quieter to-day and firm. Straits quoted at £90, spot, and £90. 10/ for three months' futures.

**Copper.**—A fairly active business, but prices easier to-day. Chili Bars quoted at £46. 17/6, spot, and £47. 5/, three months' futures. Best Selected, £54.

**Lead.**—Prices are a shade lower and the market is quiet. Quoted at £12. 10/ for Soft Spanish.

**Spelter.**—The market is steady and rather quiet. Quoted at £22. 10/ for Ordinary Silesian.

## MARKETS BY TELEGRAPH.

WEDNESDAY AFTERNOON.

### Pittsburgh.

The Pig Iron market continues unsettled. A Valley furnace is reported as having sold Forge Iron at \$17.80, 4 months, delivered Pittsburgh. A rumor obtains of 3500 tons Bessemer Pig at \$21.50, cash, but it is not credited by some of our best informed brokers, who are offering to sell at \$21, cash. Bessemer Steel Billets are quotable at \$33@33.50, cash, with but few sellers at present below \$33. Steel Rails are weaker and may be quoted at \$34@35, cash, on cars at mill. There appears to be no demand for Muck Bar or Old Iron Rails here. Some of the brokers report an improved inquiry and there is a probability of a general improvement before long.

### St. Louis.

The market shows signs of increasing weakness and No. 1 Foundry is quoted at \$18.50; No. 2, \$18, and Gray Forge \$17, f.o.b. St. Louis. It is reported that the Southern furnaces will shortly issue a new list of prices which will be at least \$1 less than the figures quoted in my mail report.

[On Saturday, the 1st inst., the Oliver Iron and Steel Company, of Pittsburgh, declared a dividend of 10 per cent. and issued drafts to the stockholders payable on the 21st inst. The announcement of this dividend is of special interest on account of the fact that only a month ago this firm paid off the last yearly installment of an indebtedness of over \$1,300,000. The firm were granted an extension in 1885 and paid the above amount in five

yearly payments with 6 per cent. interest. Mr. H. W. Oliver, senior member of the firm, states that their affairs are in an extremely prosperous condition, caused by the excellent condition of the iron and steel markets.

## Foreign Markets.

### EQUIVALENTS.

	Cents.
Franc, Peseta or Lira.....	19.3
Florin (Netherlands).....	40.3
Florin (Austria).....	35.9
Escudo (Portugal).....	41.38
Milreis (Brasil).....	54.6
Mark (Germany).....	23.8
Kilogram.....	2.206
Picul.....	134.

### BRAZIL.

PARA, February 28, 1890.—**India Rubber.**—February receipts amount to 1300 tons. Our market is strong, with an advancing tendency, in consequence of the short crop. Fifty tons Amazon have just been sold on private terms. —Per cable direct.

### CHILI.

VALPARAISO, January 3, 1890.—**Copper.**—Sales for the fortnight have been confined to 4110 quintals at \$19.56½ @ \$20, equaling £49. 17/6 in England. Buyers are scarce at the recent advance. Coal on the spot has declined, while distant affoats are dearer. We quote English spot, 45/; December sail, 45/, and Australian, 39/. Exchange has been drooping; to-day's quotation, 90 days' sight on London, is 25d.—Weber & Co.

### MEXICO.

PROGRESO, YUCATAN, February 21, 1890.—**Hemp.**—The shipments abroad of Sisal Hemp or Henequer from this port last year, nearly all to New York, reached 40,406 tons, as compared with 35,179 in 1888, an increase of 14 %. —Gazeta Oficial.

### EAST INDIES.

PENANG, January 18, 1890.—**Tin.**—Our last report was dated 7th inst., since when 15,000 piculs have arrived. Europeans bought 6000 piculs, and Chinese 9000. There has been a decline from \$34.66 to \$34.05 ¾ picul, but there is none offering at the inside figures at the close. —Schmidt, Kustermann & Co.

COLOMBO, CEYLON, January 4, 1890.—**Plumbago.**—A moderate amount of business has been transacted at steady rates. We quote at the close in rupees ½ ton: Large Lumps, 210 @ 250; Ordinary Lumps, 180 @ 230; Chips, 100 @ 130, and Dust, 70 @ 100. Since October 1 shipments have been distributed as follows, confronting this year's figures with those of the previous year: To England, 52,610 cwt., against 17,551; to Hamburg, 2569, against 1250; to Antwerp, 2778, against 180; to Bremen, 368, against 456, and to the United States, 81,009, against 22,209; together 139,378, against £43,376. Exchange.—Six months' sight, 1/5 7-16. —Volkart Bros., Ceylon and Malabar Coast, through their agent in New York, Mr. John W. Greene, 82 Wall street.

### SPAIN.

BILBAO, February 8, 1890.—**Iron Ore.**—There are at present in port ready to load Ore no less than 120 steamers of a joint capacity of 185,000 tons, causing a more active demand for Ore and improving figures. Thus for Superior quality Rabios 9/9 @ 10/ has been paid, and for Inferior 8/9 @ 9/3, while Campanil has been and is currently bringing 12/. Shipments so far this year reach 450,086 tons, as compared with 416,836 same time last year and 446,612 in 1888.—Bilbao Maritimo y Comercial.

The Edge Hill furnace, Edge Hill, Montgomery County, Pa., was successfully "blown in" on the 26th ult., and is turning out at an average of 65 tons per day of high grade Bessemer Iron.

The McCaffrey File Company of Philadelphia, have just finished an additional forging shop, 40 x 120 feet, which enables them to increase their output 20 per cent. and makes their plant one of the largest and most complete in the country.

The Belgian Commercial Companies in the Congo Free State have determined to employ American citizens of African descent to fill their responsible positions in the Congo country. Col. Geo. W. Williams, of Worcester, will seek recruits from the

chief industrial schools of the Southern States, and by next autumn from 20 to 30 engineers and skilled mechanics are expected to be on the ground.

The new reservoir and additional pumping station for the Nassau Water Works, in Brooklyn, will be ready for use six months hence, doubling the water supply at Ridgewood. It will be a duplicate in size of the present one, having an area of 25 acres, a depth in the middle of 20 feet and a capacity of 160,000,000 gallons. The cost of the construction will be about \$325,000, and it will increase the quantity of water on hand to a seven days' supply, as the Mount Prospect, a high-service reservoir, holds about 30,000,000 gallons. The new pumping station will have a capacity of 20,000,000 gallons a day to keep the reservoir full and to provide for future demands. The supply in the conduit from the ponds and streams along its route to the Hempstead storage reservoir has been added to by driven wells at various points, so that the maximum quantity of 60,000,000 gallons is provided. The contracts have recently been given out for an extension of the conduit ten miles further east, to Massapequa Pond, and the building of another conduit alongside the present one to the pumping station, so that 20,000,000 gallons a day additional can be secured. The cost of this work will be upward of \$5,000,000. Up to the present time the water-works system of the city has cost about \$12,000,000.

Why corn is cheap is explained by the single fact that the supply exceeds the demand. A St. Louis paper says this, practically speaking, is all there is to the matter. High rates of freight and lack of adequate transportation facilities, due to want of a sufficient number of cars to haul the grain promptly, are influences which, of course, have some slight effect in putting down rates. The dominant factor in the problem, however, is the tremendous crops which have been harvested in the past two years, without any corresponding increase in consumption.

The efficiency of the telegraph service in the United States compared with that of Great Britain appeared from the statements of President Green, of the Western Union, before a Congressional committee last Saturday. Respecting rates generally, Dr. Green said they were about one-half of those prevailing 22 years ago. The ratio between our own and the British rates was as 25 cents to 20 cents. The Postmaster-General proposed to reduce these rates one-half, and this in the face of the fact that the British system had been operated with a deficit of \$11,800,300 in the past 11 years and probably \$30,000,000 since its establishment. The British system had about one-fifth of the poles and one-quarter of the wire of those owned by the Western Union. That was compact in an open, closely-settled country, so that its maintenance cost about one-fourth of the cost of maintaining the lines in this country. If our Government embarked in the telegraph business it must have managers or the business would go to the bottom. The Western Union handles over 100,000 messages a day at New York alone.

At Findlay, Ohio, an experimental plant is being constructed to test the process of R. P. Wilson. It is reported that it is a modification in the design of the ordinary Bessemer converter.

Passaic Furnace, in New Jersey, was chilled recently and is out of blast.

Keystone Furnace, Reading Iron Company, Reading, Pa., blew in No. 1 stack on the 2d inst.



## Hardware.

The volume of business which is doing does not show any material increase from last week, but a good number of assorted orders are being received. Some of these are from jobbing houses who are urgent that the goods be sent to them promptly, indicating that their stocks are small. This applies especially to goods large orders for which were not placed a few months ago in anticipation of an advance in price, the stocks of this latter class of goods being for the most part ample for the requirements of the present and the near future. The bad condition of the roads in many parts of the country and the fact that collections are difficult have considerable influence in keeping back orders. With the comparatively quiet trade of the past month or two some manufacturers of Hardware have accumulated something of a stock, and there are evidences that some of them are desirous of making sales, but to induce purchases they are not making any material concessions in price. Conservative and well-informed parties while describing the present situation as characterized by only a fair trade and prices as being fairly firm but not strong, look upon the outlook as promising for a good season's business, their view being that in the ordinary course of things within a few weeks a demand will set in when present prices will be maintained, with a possibility of advances in certain lines.

### Cut Nails.

The market is a little lower, concessions being made for desirable orders. Reports indicate that throughout the country stocks are running low. Buyers are holding off and argue that the decline in Wire Nails foreshadows a fall in the Cut Nail market. It must be remembered, however, that the manufacturers of Iron Cut Nails have not obtained prices commensurate with the advance in raw materials and did not participate in the profits of the latter. It is different with the Wire Nails. There the large concerns made very handsome returns on their Rod mills and are still doing quite well with them. We quote from Cut Nails, in carload lots on dock, \$2 to \$2.05.

### Barb Wire.

The demand in this market is quiet and prices, while nominally unchanged, are not quite so firm as heretofore. They remain as follows: For Four-Point Galvanized, carload lots, 4 cents; 3-ton lots, 4.1 cents, and small lots, 4.3 cents, with deliveries.

There is some consideration being given as to the feasibility of reviving the Federal Steel Company scheme, but the matter has not assumed any definite shape, and it is a question whether it will be found desirable to make a definite effort in that direction.

### Wire Nails.

During the past week there has been only a moderate business in Wire Nails and at prices such as were referred to in our last report. It is understood that some of the leading companies have accumulated large stocks of goods, and in view of the condition of the market and the large production of the different mills a two weeks' stoppage is under consideration. Quotations are on the basis of \$2.80 for carload lots at mill, but it is probable that this figure could be shaded on large orders.

### Miscellaneous Prices.

A misleading typographical error occurred in our issue 20th ult., in giving quotations on the Police Goods manufactured by John P. Lovell Arms Company, Boston, Mass. The discount was there erroneously stated as 75 per cent., instead of 25 per cent., the correct figure. The trade will observe that in our current prices, as given in the same issue, the goods were correctly quoted under the heading Hand Cuffs and Leg Irons. The trade will please to note this correction.

The Lawn Mower market is, on the whole, lower than last season. A very large business has been done by the manufacturers in booking orders, and the season promises to be a satisfactory one. The old and well-known makers continue to hold their full share of the trade, but a wide sale is found for some of the newer and cheaper machines, among which it is generally conceded there are some of real excellence. A great many machines are being made with special names for leading jobbing houses who control the sale of them, thus giving them an inducement to push the machines. This practice, however, is not regarded by the manufacturers with any especial favor, as it deprives them of the advantage of selling their machines under their own name.

The American Axe and Tool Company, whose principal office is at Pittsburgh, Pa., have their Eastern and Export office at Troy, N. Y., from which a circular is issued soliciting orders for Axes and Tools. They state that they are prepared to furnish the following brands, all of which are now controlled by them:

Sharp's and Hunt's and Southern Star—Douglas Axe Mfg. Company, Boston, Mass.

Hurd's Razor Blade and Blair's Victor—Lane & Gale, Troy, N. Y.

Mann's Red Warrior—Wm. Mann, Jr., & Co., Lewistown, Pa.

Lippincott—Hubbard & Co., Pittsburgh, Pa.

Peerless—Powell Tool Company, Cleveland, Ohio.

Francis Axe Company—Francis Axe Company, Buffalo, N. Y.

Underhill Edge Tool Company—Underhill Edge Tool Company, Nashua, N. H.

They state that the goods are made at the same factories and under the same managements and superintendents as heretofore, and that there is as yet no change in prices for export, notwithstanding the advance in material. Their desire is to maintain all the relations in the future that have existed in the past between the trade and the factories whose interests are now represented. Orders for export and from New England States and the State of New York should be sent to the Troy office.

It will thus be observed that the company are proceeding promptly to take advantage of their compact and comprehensive organization, which gives them almost entire control of the Axe market of the country. It is becoming apparent that their plans have been carefully made and carried out and that other manufacturers besides those whose names were prominently mentioned in connection with the consolidation are co-operating with the company, if they are not technically included in it, so that many of the smaller manufacturers are practically out of the market, leaving the American Axe and Tool Company in undisputed possession of the field.

The market for Hatchets continues without important change, but is perhaps somewhat firmer from the fact that the manufacturers whose interests are now united in the American Axe and Tool Company

are to a certain extent removed from the animated competition which has existed. Many of the leading Hatchet manufacturers are, however, outside of this arrangement and it is an open question as to the extent the market will be affected by the consolidation.

The market for Ice Cream Freezers is in about the same condition as last year's, prices not varying materially and there being comparatively few new Freezers offered to the trade.

There is some irregularity in the price of Door Knobs, owing to the fact that some Western goods are entering into active competition with those which have heretofore held the market. In a general way 60 to 65 cents per dozen may be named as the price of Mineral Knobs and 70 to 75 cents as the price for Porcelain Japanned.

The increased price ruling in Germany for Halter and other small Chains is having the effect of considerably reducing the imports in this country, and American Chains are to a certain extent taking their place. If the present tendency toward higher prices on the other side continues it will cause a considerable falling off in business in this and other goods similarly affected.

The Rope market is unchanged, and remains very firm at former prices. There is some tendency toward higher quotations, and many of the jobbing houses refuse to sell Sisal lower than on a basis of 12½ to 12¾ cents. Some leading Western jobbers are, however, selling at 12 cents.

Jute Binding Twine is being used to an increased extent in place of Sisal or Manila, there being in many parts of the country a disposition to resist the prices enforced by the combination.

A strong combination has been formed in Rubber Goods, especially in the line of Boots and Shoes, and efforts have been made to control in a similar way the manufacture and prices of Mechanical Rubber Goods, such as belting, hose, packings, &c. Thus far nothing has been accomplished in this direction, and it is considered doubtful whether the plan will be carried into effect. Thus far nothing has been accomplished in this direction, and it is considered doubtful whether the plan will be carried into effect. The price of these goods remains unchanged, but the condition of the crude Rubber market has a certain effect in inducing firmness in price. The higher prices prevailing for the raw material are owing principally to the political disturbances in South America, and if there should be a considerable further advance the manufactured goods would be held at higher figures.

The market for Loaded Shells is not as firm as it has been, and it is expected that the manufacturers will within a short time announce a reduction in price. On this account it will perhaps be well for those in need of the goods to defer ordering if they can do so until such reduction is announced or the matter is definitely settled.

The competition between the Powder manufacturers, which has been so animated for more than a year, continues unabated, and the prices ruling are accordingly regarded as low and are referred to by the manufacturers as unprofitable.

The File market is firm and generally in excellent condition, prices being maintained with regularity and the demand good. The slight advance which was made in prices a month or two ago is being adhered to by the manufacturers, but before the advance was made large orders had been booked, so that the merchants rather than the manufacturers are in many





upon the statements of middlemen as to the condition of the trade, who perhaps are prejudiced one way or the other. The demand for drugs and medicines of all kinds is assuming large proportions, and in chemist shops throughout Australia and New Zealand familiar American medicines meet the eye. We could go on enumerating various goods now purchased in foreign markets which until a few years ago had no sale whatever, and it is only a question of a few years when our export trade will have assumed such respectable proportions that the manufacturers in this country will turn their eyes in that direction.

There is an idea existing that goods for export must be sold at least 10 or 15 per cent. lower than for home trade. While this is true in a great many instances, it is also true that many manufacturers consider their export trade the most profitable part of their business.

A correspondent of the *London Ironmonger*, writing from Queensland, contradicts a statement that cheap and low quality goods are saleable in Australia, and refers to his experience as being that nothing but goods of the best quality can readily be sold there. Speaking of Cutlery especially, after mentioning that it is essential that the best Steel and workmanship be put in the goods, he continues:

It is hardly possible for the manufacturers at home to realize how important it is for the bushman to have a good tool. Before it reaches him, probably from 500 to 1000 miles in the interior, it passes through the hands of the importer, storekeeper, &c., and he frequently has to pay 4/6 for an article that could be purchased retail in Sheffield for 1/. The firm I represent had no trade for Cutlery until I introduced it, since which the trade has wonderfully increased. The ordinary goods which we imported some eight years ago have not yet been sold, while goods containing the best workmanship have been indented several times per year, with an ever-increasing demand. The Australian consumer does not require to be educated in the matter of quality. He is perfectly willing to pay for the best article, and it is the fault of the manufacturers that the best goods were not introduced from the very start.

The correspondent then goes on to refer to the importance to English manufacturers of pushing their goods energetically in the foreign field, a matter which we need scarcely say is deserving of equal attention from the manufacturers of this country.

In conclusion, I would earnestly impress upon the Sheffield manufacturers the desirability of advertising and pushing their Australian trade. It is increasing, and in the near future Australia will be the largest market for Sheffield goods. As soon as competition is developed here and the consumer has an opportunity of purchasing Sheffield goods at a reasonable price, instead of, as at present, having to pay from 100 to 200 per cent. profit, the trade will increase at a rate that very few can realize.

#### Items.

Mallory-Wheeler Company, New Haven, Conn., and 64 Reade street, New York, have issued an appendix to their catalogue containing illustrations of a new design in Bronze Goods patented December 31, 1889. They are now prepared to furnish all ornamental Bronze Front Locks described in their 1889 catalogue, with fronts of this new design, which will be known as B. They have a new finish which they designate as No. 5, which can only be obtained in this design, and which they describe as a combination of the finishes known to the trade as No. 1 and No. 3, producing a changeable effect in the background similar to watered silk.

Richards & Conover Hardware Company, Kansas City, Mo., have issued their spring catalogue, which represents a line of season goods. Blacksmiths' and Machinists' Tools and Machines are also shown. It is a well-printed pamphlet of 100 pages, with many illustrations. It is explained, however, that it refers only to a small portion of the company's stock,

and reference is made to their complete line of Heavy, Shelf and Builders' Hardware, Tin, Japanned and Stamped Ware and Tinnings' Trimmings. The company have recently added to their room the four-story brick house, corner Union avenue and Hickory street, and are now provided with complete switch facilities, enabling them to give carload orders prompt attention. In addition to the representation of goods, the catalogue also contains in convenient form the following standard lists: Common Carriage Bolts, Machine Bolts, Coach Screws, Tire Bolts and Iron and Brass Screws.

The trade will observe on page 98 the advertisements in which Sickels, Sweet & Lyon, 35 Barclay street and 40 Park place, New York, call attention to their business as wholesale dealers in Hardware, Cutlery and Guns. They make the point that they are carrying goods of the leading Hardware manufacturers at makers' prices, giving their customers the advantage of purchasing in one order and receiving in one shipment a variety of goods with the least possible expense, trouble and delay.

We are in receipt of a very handsome and elaborate catalogue of the Geuder & Paeschke Mfg. Company, Milwaukee, Wis. It is 11 x 8 inches in size, bound in smooth brown cloth and containing nearly 200 pages. No prices are given in the catalogue, because, as the publishers state, frequent changes would render the prices valueless, but they print under another cover a full list of prices which they will be glad to send on application. In presenting this catalogue for 1890 to their friends and patrons, they inform them that they are now located at their new factory, St. Paul avenue and Fifteenth street, where they have largely increased facilities for manufacturing. The book is exceptionally well indexed, one index dividing the contents under departments, following which would show the scope of this firm's business: Pieced Tinware, Copperware, Sheet Ironware, Galvanized Ironware, Stamped Ware, Stamped Tinnings' Trimmings, Mica, Japanned Ware, Toilet Ware, Granite and Agate Ware, Refrigerators, Stove Boards, Bird Cages, Oil and Vapor Stoves, Sieves and Miscellaneous. Following this is a complete alphabetical index, after which is the catalogue proper. All the goods are fully illustrated and tables of sizes and styles are furnished, the prices, as before noticed, being left blank. A pretty feature of the book is the engravings that decorate the first page of each section, all of them being appropriate to the class of goods that follow. Another decorative feature is the double red line about each page with scrollwork corners.

Sidney Shepard & Co., Buffalo, N. Y., have issued an appendix to their illustrated catalogue, April 1, 1889. It relates to an interesting line of Seamless Straight Stamped goods, to which several recent additions have been made, Spun Copper Tea Kettles, Clothes Wringers, Refrigerators and a number of specialties and miscellaneous goods. They also call attention to Mayhew's Adjustable Soldering Copper and to the Standard Air Rifle.

The Chicago Stamping Company, 10, 12 and 14 Lake street, Chicago, have issued a 40-page circular of seasonable goods for the spring and summer of 1890. The line of goods illustrated and described in this circular comprises Freezers, Oil Stoves, Refrigerators, Ice Tools, Bird Cages, Water Coolers, Wire Cloth, Lemon Squeezers and a very great variety of smaller articles in the line of house furnishing wares. The line of Bird Cages offered by the company is exceedingly large, comprising numerous varieties and embracing every style of cage now put

upon the market. The line of Refrigerators which they handle is the Challenge Iceberg. The Freezers they offer are the White Mountain and Granite State. The Oil stoves are known as the Summer Queen. In connection with the goods offered in this circular they also handle Roofing Tools and a full line of Tin Plates and Metals. They also issue a catalogue and price-list of Milk Can and Dairy Supplies; 29 pages are devoted to their exhibit of this important line of goods.

Thorsen & Cassady have opened an establishment at 60 and 62 Wabash avenue, Chicago, to supply the trade with Sporting Goods. A general line will be kept, embracing Fire-Arms, Ammunition, Fishing Tackle, Bicycles, &c., as well as Cutlery. Both members of the firm were connected for years with the Sporting Goods department of Hibbard, Spencer, Bartlett & Co., and therefore thoroughly comprehend the requirements of the trade. They have in preparation a catalogue of the lines which they will handle, and will shortly have it ready for distribution.

The Standard Fiber Ware, manufactured at Mankato, Minn., is meeting with much favor among the dairy farmers of the West. One of the strongest evidences of this fact is a very large order recently received from one firm in Nebraska. The order called for no less than 10,000 Pails. Small orders are very numerous, covering the West quite generally. The Standard Ware has now been thoroughly tested by dairymen and evidently is found to be well adapted for their purposes.

The attention of the trade is directed to the advertisement of the Midgley Wire Belt Company, of Beaver Falls, Pa., which appears on page 42 of this issue. Their plain Wire Belting is shown in rolls ready for shipment and also their Wire Belting covered with rubber. This style of Belting is intended specially for outdoor uses, such as Agricultural Machinery, Threshing Machines, Sawmills, &c. It is also adapted for iron pulleys and can be operated any place where a rubber or a leather Belt has been used. A new catalogue will be issued in a short time by the company, and will be sent to any address upon application.

The advertisement of Frank W. McLean, Room 505, Hamilton Building, Pittsburgh, Pa., dealer in Hardware and Iron and Steel supplies of all kinds, will be found on page 69 of this issue. Announcement is made that prices in the above lines of goods will be furnished on application.

Jno. M. Waddell Mfg. Company, Springfield, Ohio, have issued a striking and attractive catalogue, representing their Coffee Mills and specialties. Pictorial humor is utilized to call attention to some of their goods. Coffee Mills are given a prominent place, but Rat Traps, Clothes Wringers, Sash Locks, Broom Holders and other goods are also represented.

Harmon & Dixon, 118 Chambers street, New York, report that their Empire Sheathing Paper is used extensively in this country, Mexico, Central and South America, taking the place of the rosin-sized paper and tarred felt. Its use is not confined to roofing and building purposes alone, but, as it is obnoxious to mice and vermin, a single layer spread on carpets is referred to as making habitable houses infested by ants and other vermin. As a lining for walls, where it is desirable to exclude dampness, it has been found especially adapted, and as a protection from salt air and climatic influences, which would injuriously affect merchandise of all kinds when in course of transportation, especially to foreign countries, it is claimed that it is especially excellent. To meet these severe requirements the

Sheathing Paper is made in three grades of thickness and put up in rolls 3 feet in width, the rolls containing 275, 500 and 900 square feet respectively. Each roll weighs 28 pounds and occupies a space of  $1\frac{1}{2}$  cubic feet. Its compactness is thus referred to as an additional advantage possessed by it. The fact that this Paper is offered at an exceptionally low price for water-proof sheathing is also mentioned.

We are advised that the business of the New American File Company, Pawtucket, R. I., has recently been thoroughly reorganized. Joseph E. Jenckes, of the E. Jenckes Mfg. Company has been elected treasurer, and the work of the factory has been put in the hands of a man of large experience in the File business, who is referred to as thoroughly competent to keep the work turned out up to a high standard.

Kidd Steel Wire Company, Pittsburgh, Pa., have issued a new price-list which is substantially the same as their former one, except that they have added some new sizes from No. 60 to 80. They report that they are very busy at the factory drawing polished Drill Rods in square, hexagon and octagon shapes and refer to the fact that some manufacturers have found this square section to be of great advantage to them, as heretofore it was necessary to plane the steel square.

Rockford Bit Company, Kokomo, Ind., have appointed J. C. McCarty & Co., 97 Chambers street, New York, their general sales agents for their Auger Bits, who will at all times be in position to name the lowest prices to the trade. They will also, we are advised, carry a stock for the accommodation of customers in this vicinity.

Among the Special Notices on page 65 will be observed one of the East Chattanooga Land Company, Chattanooga, Tenn., by whom free sites for factories and other liberal inducements are made to manufacturers.

Cleveland Fence Company, of Indianapolis, Ind., whose Tightener is illustrated on page 400, issue several circulars relating to their manufactures. Among these are Farm Fencing manufactured under recent patents, Yard Fencing and Gates, the special features of which are explained.

E. T. Barnum, Detroit, Mich., issues an effective 72-page catalogue showing the large variety of Wire, Wire Goods and Iron Work which he is putting on the market. It covers an interesting and varied line of Roof Cresting, Wire Counter Railing, Wire and Iron Fences, Wire and Iron Window Guards, Stable Fixtures, Fire Escapes, Balcony Railing, Wire Signs, Jail Cells, Iron Beds, Sidewalk Lights, Coalhole Covers and Weather Vanes.

G. G. Stuart, formerly traveling salesman for Francis Chenoweth & Co., Hardware merchants, of Birmingham, Ala., was a caller in our Pittsburgh office during the present week. Mr. Stuart reports that business in the South is in very good shape at present, and that the outlook for the future is very bright. Mr. Stuart has engaged with H. C. Marshall, 110 Chambers street, New York.

The partnership heretofore conducted by Charles F. Guyon, James H. Cutler and Rufus L. Woodrough under the firm name of C. F. Guyon & Co., was dissolved February 28 by mutual consent. Charles F. Guyon and James H. Cutler will sign in liquidation and close up the business of the firm. It is also announced that the C. F. Guyon Company, Limited, has been formed and has succeeded to the business heretofore carried on by C. F. Guyon & Co. They will remain at the same ad-

dress, 97 and 99 Reade street, New York. Harold S. Crane is president of the new company, C. F. Guyon, treasurer, and Thomas W. Munroe, secretary.

In the revised classification of freight of the Southern Railway and Steamship Association, which went into effect March 1, a number of changes of more or less importance are made. In this revision it has been the aim among other matters to make the classification more specific and thus remove some of the uncertainty which was encountered under the former classification. Cross references are also made facilitating the finding of the classification of many articles.

In their striking advertisement on page 54 Norton Emery Wheel Company, Worcester, Mass., call attention to their Emery Wheel Machinery, Emery and Corundum Wheels, &c. Special mention is made, it will be observed, of Water Tool Grinders and Wheels for Brown & Sharpe's Grinding Machinery.

We are advised that A. G. Newman, 1180 Broadway, New York, has still on hand a few of the catalogues of Hardware of his manufacture which were issued a little more than a year ago, which may be obtained by houses who are interested in the fine grade of goods to which they apply. The catalogue is a volume of almost 400 pages fully illustrated and relates to some kinds of goods which are not often represented in such catalogues. Especial attention is given to artistic styles of Hardware to meet the growing demand for such goods.

Something of the effect of the advances which have been occurring in the prices of English goods is indicated in the suggestion of a correspondent of the London Ironmonger to the effect that the makers of a variety of articles would serve the interest of retailers by revising their list prices. Up to the present time they have been content with reducing the discounts, thus diminishing the retailer's profit, it is said, by 10 or 15 per cent. The complaint is made that there is thus left a margin of 10 per cent., out of which freight may cost 5, leaving a meager 5 per cent. to stand against the expenses of rent, &c., and risked credit. The confidence that exists in the stability of the higher range of prices is indicated in the remark made by the correspondent that it is not likely that goods will ever again be so low as heretofore, as wages will not be permitted to drop to such starvation prices as recently ruled.

Lane & Gale, Troy, N. Y., have issued a circular in which they allude to having disposed of all their interest in the manufacture of Axes and Tools to the American Axe and Tool Company, whose central office is at Pittsburgh, Pa. They also state that they will continue the sale of Eagle Square Mfg. Company's Steel and Iron Squares and Boring Machines and C. T. Lane's Crescent Eye Hoes as heretofore.

The name of the Madden & Cockayne File Company, Middletown, N. Y., has been changed to that of the Eagle File Company. With reference to this change the following announcement is made by the company:

We commenced the manufacture of Files and Rasps in 1857 and for a number of years our goods were known under the name of Wheeler, Madden & Clemson. In the year 1875 we became incorporated under the name of Madden & Cockayne File Company, and during these years we have used the name Eagle, either separately or in connection with other words and brands, as our trade-mark. We shall continue the manufacture of the Eagle Files and Rasps under this name and trade-mark, and guarantee all our goods bearing this stamp to be strictly first-class in quality and workmanship.

In connection with their March calendar, The Nubian Iron Enamel Company,

Chicago, Ill., send out another neat pamphlet giving testimonials to the merit of their manufactures and also presenting in an attractive way the points which they make in regard to the quality and desirability of their goods.

Lalance & Grosjean Mfg Company, New York, issue a circular in which they refer to intimations given by other manufacturers to the effect that their Sinks are infringements on certain patents, and state that the Sinks furnished by them are not infringements of rights patented to others, and that they will defend any suit or suits that may be brought against their customers and protect them from damages.

In their advertisement on page 14 Reynolds & Co., New Haven, Conn., give an interesting exhibit of the large line of Screws and Bolts, of which they are manufacturers. It will be observed that it embraces Iron and Steel Set Screws, Cap and Machine Screws, Machine Bolts, Stove Bolts, &c.

William J. H. Gluck, Baltimore, Md., issues a pamphlet of some spring and summer specialties. It relates to Water Coolers, Freezers, Milk Pails, Oil Stones, &c. Another pamphlet is devoted to the May Queen Ice Cream Freezer in connection with a description of which a number of recipes are given.

The Perkins Lock and Mfg. Company, Cleveland, Ohio, have issued a circular in which they describe a front door Lock with night attachment operated by one key and one keyhole. With the use of this Lock the point is made that the front door can be locked and not simply fastened with the night attachment only, while both the bolt and latch can be opened by the one key, thus obviating the necessity of carrying two keys, as is necessary with the ordinary Locks.

Wells Bros. & Co., Greenfield, Mass., issue a convenient and satisfactory catalogue of their Little Giant Screw Plates. It furnishes their trade in a neat and compact way with a list of this branch of their many labor-saving tools. The pamphlets are intended to be used by the trade in calling the attention of their customers to the goods and are furnished with the merchant's name and address printed on them. They certainly serve this purpose admirably and will doubtless be appreciated by the trade.

A. Tredway & Sons Hardware Company, Dubuque, Iowa, have issued their spring circular, in which a prominent place is given to the Withington & Cooley Mfg. Company's Forks, Rakes, &c., Hussey, Binns & Co.'s Shovels and Spades and a line of Wheelbarrows, while Grindstones, Spring Hinges, Poultry Netting, Freezers, Milk Can Stock and other seasonable goods are also represented.

In the new catalogue issued by the F. F. Adams Company, Erie, Pa., it is to be observed that for the convenience of export buyers especially information is given in regard to the dimensions and weight of the packages containing the different goods, as for example, their Keystone Wringers. After description and list prices they say:

For Export.—Wringers are packed one-half dozen in a case of the following dimensions and weights:

	No. 10.
Length, 22 $\frac{1}{2}$ in. ....	gross 112 pounds.
Width, 19 $\frac{1}{2}$ " .....	
Depth, 13 $\frac{1}{2}$ " .....	net 87 "
	Nos. 16 and 18.
Length, 23 $\frac{1}{2}$ in. ....	gross 129 pounds.
Width, 21 $\frac{1}{2}$ " .....	
Depth, 13 $\frac{1}{2}$ " .....	net 100 pounds.

The advertisement of the Avery Stamping Company, Cleveland, Ohio, which appears on page 89, illustrates some of the



many forms of their work, and is suggestive as showing what can be done in this line.

The Mallory-Wheeler Company, New Haven, Conn., and 64 Reade street, New York, are preparing a new and complete illustrated catalogue of their manufactures which it is expected will be ready for distribution before very long.

The advertisement occupying page 94 will be regarded by the trade with special interest, giving as it does in a compact form illustrations of some of the leading fine Mechanics' Tools manufactured by L. S. Starrett, Athol, Mass.

Johnson Mfg. Company, Collins, N. Y., have issued a catalogue and price-list of the Menar Patent Copper Tea Kettles, Wash Boilers, Urns, &c., of their manufacture. They announce that they have secured and now control the patents under which these goods are manufactured. The catalogue illustrates a variety of Tea Kettles of copper and copper and tin, and also Copper Range and Parlor Kettles, English Toddy Kettles, Coffee Urns, All Copper Basins, Dippers, Funnels, Measures and Lemonade Shakers and All Copper and Copper and Tin Wash Boilers.

The attention which is being given to Bicycles, &c., is indicated in the announcements which are made from time to time in our columns in regard to new and improved machines which are put on the market, as well as concerning the regular goods which are well known. Among such announcements that on page 90 in which the Overman Wheel Company, Boston, Mass., illustrate their Victor Bicycles will be of interest. The illustration of their factory showing the addition erected last year indicates the extent of their manufacturing facilities.

Lingo, Waples & Co., Dennison, Tex., announce that on the 21st ult. they sold their stock of Hardware and Agricultural Implements to the Leeper Hardware Company. The new company is stated to be incorporated under the laws of West Virginia, with a paid-up capital of \$51,000. The following are its officers: Edward D. Leeper, president; Levi Lingo, who has heretofore been in charge of the business, vice-president, and John B. Leeper, secretary and treasurer.

The Adams & Westlake Company, Chicago, Ill., in connection with their other business have begun the manufacture of Brass Bedsteads. They state that they will produce a superior quality of work, adopting throughout the English system of construction and finish, and employing expert English mechanics trained to the business and importing all necessary material direct from Europe. They emphasize the superior quality of the goods, and in point of finish as well as mechanical excellence they guarantee them to be the equal of any imported.

### Trade Topics.

In the following letter, which we have received from an Arkansas Hardwareman, it will be observed that the opinion is expressed that it is not ordinarily advantageous for the retail Hardwareman to attempt to do much in goods not carried in stock, but reference is made to the fact that jobbers can with a little trouble thus serve their retail customers to their mutual benefit:

The correspondence published in your paper in regard to selling goods not carried in stock has been interesting and instructive. As far as my experience goes (13 years wholesale and 12 years here) I agree entirely with the Indiana Hardwareman who described the difficulties and an-

noyances connected with such business. If anything, my experience is worse. I should think, however, that with the jobber the case is different, and that he could do "buying out" to good advantage and satisfaction to his customers. The difference in this kind of business between jobber and retailer is as follows:

1. It does not take so much time in showing catalogues, describing goods, &c., to find out what the customer wants. The order is sent in to jobber, there it is in black and white—for instance:

1 box Dbl. Strength Glass A, 24 x 36.  
1 doz. Flat Paint Brushes, 4 in., \$4 to \$4.50.

If the jobber buys these articles and sends them with the bill of Hardware, it is a great help to the retailer, as he may only want these two items, which would hardly pay to enter separately from another house.

2. There is no risk for the jobber; if his customer is good for a bill of Hardware he is certainly good also for the goods bought out for him. The disadvantages to the jobber would be that he would be obliged to have a well-informed buyer and also that he could not make as much profit on the goods bought out as on goods kept on hand, but this would in my opinion be greatly overbalanced by the hold this would give him on his customer. I have bought almost exclusively from the same Hardware jobbers for 11 years, and one of the main reasons for doing so was the fact that they filled my orders as near complete as could be done, and bought out such goods as they did not have on hand. To find inclosed with a bill a list of goods with the remark "These articles we do not keep" when I know they could have got them by spending ten minutes' time is rather aggravating, especially when they have to be ordered right then, and it takes seven to ten days to get them, and the next time goods are ordered said house will most likely be passed by. I am satisfied that it will pay the jobber to accommodate his customers as above indicated, but would like to hear from others on the subject.

The following letter from a Hardwareman in Iowa refers to an annoyance which he has encountered, in which he will probably have the sympathy of others, and it also describes a remedy which he suggests:

I am, and I know others in the Hardware business must be, annoyed a great deal by the practice of tea houses and baking powder firms of putting their goods on the market and giving with each pound of tea or package of baking powder a porcelain Kettle, Oil Can, Hand-Sled, Whip or some piece of Tinware and other goods too numerous to mention. All of such goods given away is a direct cut on the Hardware merchant, and the grocery and general stores are very quick to put such goods in stock, and the consumer, of course, buys them. In a great many cases, it is true, the goods he gets are of such poor quality that they are almost worthless, as is also the stuff that is given away with them. But it seems a majority of the American people like to be swindled and they keep buying the stuff. I don't wish to consume too much valuable space in your paper, but I wish to propose a remedy, and the only chance I see is by retaliation, and my plan is for some manufacturer to combine with some line of staple goods that is an every-day seller half or one pound of tea (uncolored Japan, which is sold throughout the country at a profit to the retailer of from 80 to 120 per cent., 100 per cent. being the average; this tea is more generally used than any other), of which a good grade can be bought of any jobber at from 20 to 26 cents per pound, and if bought in large quantities from the importer can be got for much less. These figures I know

to be facts, as I understand the grocery business thoroughly. In this plan I think I see some money for some one, as well as the prospect of making the general stores sick of doing a Hardware business as a side line, as these scheme will cut one of their most paying sellers. I am ripe for something of the kind. Let others so afflicted speak.

### Exports.

PER BARK CALLER ON, FEBRUARY 14, 1890, FOR BRISBANE, QUEENSLAND.

By Collins & Co.—5 dozen Edge Tools.  
By Goulds Mfg. Co.—114 Pumps.  
By W. K. Freeman.—1530 pounds Tackle Blocks.  
By Welsh & Lea.—19 cases Iron Bolts.  
By Winchester Repeating Arms Co.—24 Rifles, 5000 Cartridge Shells, 50,000 Primers.  
By F. B. Wheeler & Co.—1 case Hardware, 24½ dozen Brushes.  
By H. W. Peabody & Co.—69 packages Wood-working Machinery, 560 pounds Nails.  
By A. S. Lascelles & Co.—61 dozen Axes, 6 dozen Picks, 1½ gross Saws, 1½ gross Hammers, 1 dozen Scales, 16 dozen Wrenches, 8 gross Handles, 9 dozen Levels, 330 pounds Stones, 5 dozen Bits, 50 gross Chalk, 2 gross Cow Bells, 8 cases Hardware, 7 packages Hardware.  
By R. W. Forbes & Son.—1 case Thermometers, 12 packages Plows, 4 cases Hardware, 1 case Castings, 1 dozen Saw Sets, 3 cases Agricultural Implements, 2 dozen Hay Rakes, 6 packages Hardware, 1 case Agricultural Implements, 1 case Hardware, 1 case Carriage Hardware.  
By V. Basanta.—30 Fire-Arms, 36 Choppers, 6 dozen Handles, 36 dozen Axle Grease, 120 dozen Handles, 6 dozen Hammers, 2 dozen Money Drawers, 6 dozen Lampware, 6 dozen Traps, 3 dozen Cow Bells, 6 dozen Hammers, 12 dozen Springs, 52 dozen Lampware.  
By Arkell & Douglas.—134,445 pounds Barb Wire, 200 pounds Tacks, 200 dozen Hatchets, 9 dozen Lanterns, 2 dozen Broilers, 2 packages Hardware, 49 dozen Axes, 8 dozen Hatchets, ½ dozen Money Drawers, 1 dozen Bench Screws, 3 dozen Wrenches, 5 dozen Hammers, 2 Lawn Mowers, 18 dozen Axle Grease, 24 dozen Lamp Goods, 4 dozen Hoes, ¼ dozen Stuffers, 12 dozen Lanterns, 193 pounds Tinware, 1123 pounds Iron Castings, 33 dozen Axes, 24 dozen Rakes, 28 dozen Braces, 18 dozen Axle Grease, 240 Bolts, 215 pounds Iron Castings, 35 Refrigerators, 1 dozen Seed Sowers, 1 dozen Bolt Cutters, 10 dozen Rakes, 1 dozen Planters, 2 dozen Shellers, 300 feet Cotton Hose.

PER SHIP VOLGA, FEBRUARY 19, 1890, FOR MELBOURNE, AUSTRALIA.

By Thompson, Moore & Co.—1650 pounds Machinery.  
By Simpson, Hall, Miller & Co.—5 packages Plated Ware, 5 cases Plated Ware.  
By J. A. Ten Eyck.—4 cases Carriage Springs.  
By Rand Drill Company.—5 boxes Machinery.  
By H. B. Moore.—296 cases Agricultural Machinery.  
By F. B. Wheeler Company.—20 sets Springs.  
By Orson Breed.—1300 pounds Steel Springs.  
By J. McEwan & Co.—12 dozen Locks, 1 case Locks and Blanks.  
By Sargent & Co.—12 cases Hardware, 1 barrel Hardware.  
By W. K. Freeman.—2 cases Plated Ware, 6500 Cartridges, 1000 Cartridge Shells.  
By Dunbar, Hobart & Co.—16,800 pounds Nails.  
By A. S. Lascelles & Co.—33 dozen Handles 1300 pounds Nails, 3 dozen Hardware, 3 cases Plated Ware.  
By Healy & Earl.—5 cases Drills, 11 cases Forges, 3 crates Blowers.  
By A. Field & Co.—8 packages Hardware, 3 Harness Tools.  
By W. E. Peck.—2 packages Plated Ware, 213 pounds Glue, 152 reams Sand Paper.  
By H. W. Peabody & Co.—30 cases Axes, 6500 pounds Nails, 3000 pounds Nails, 15 cases Edge Tools, 44,800 pounds Barb Wire, 6000 pounds Nails, 1 Copying Press, 1 case Agricultural Machinery.  
By Welsh & Lea.—30 cases Axle Grease, 6 dozen Axes, 2 cases Hardware, 12 dozen Shears, 12 dozen Handles, 8 dozen Hammers, 12 dozen Springs, 6 cases Hardware, 3½ gross Axle Grease, 12 dozen Fly Traps, 45 dozen Hatchets, 124 dozen Handles, 2 dozen Carpet Sweepers, 6 dozen Axes, 6 dozen Bush Hooks, 2 dozen Bench Screws, 7½ dozen Braces, 7 dozen Knobs, 28 Lawn Mowers.  
By Arnold, Cheney & Co.—3826 pounds Hardware, 5 cases Machinery.  
By R. v. Cameron & Co.—16 boxes Castings, 12 cases Axes, 2 cases Handles, 3 cases Saddlery, 5 cases Axes, 8 boxes Bolts and Nuts, 5 boxes Bolts, 2 cases Axes, 2 packages

Pumps, 2 cases Carpet Sweepers, 395 pounds Hardware.

By R. W. Forbes & Son.—4 packages Hardware, 602 pounds Rubber, 790 pounds Carriage Bolts, 5 packages Windmills, 1 case Rules, 3 cases Toys, 8 packages Hardware, 100 dozen Axe Handles, 2 racks Churns, 1 case Carpet Sweepers, 6 cases Meat Choppers, 3 cases Wringers, 36 packages Hardware, 1 box Lawn Mowers, 23 Stoves, 1 bale Twine, 6 cases Hardware, 1 case Kitchenware, 4000 pounds Cut Nails, 12 packages Tools, 4 cases Plated Ware, 23 cases Wringers, 1 box Pumps, 3 cases Pumps, 15 packages Hardware, 24 dozen Rat Traps, 30 dozen Hoe Handles, 9 cases Washing Machines, 1 case Carriage Bolts, 24 packages Hardware.

By W. H. Crossman & Bro.—3 packages Pumps and Parts, 3800 Shot Cartridges, 6 dozen Potato Hooks, 25 dozen Reflectors, 2 gross Latches, 19 packages Hardware, 2 cases Lamp Goods, 11,300 pounds Barb Wire, 24 dozen Axes, 5 pounds Casting, 18 dozen Axes, 21 cases Hardware, 6 Castings, 23,400 pounds Barb Wire, 10,000 Fuse, 38 packages Pumps and Parts, 16 Brushes, 9 dozen Wood Spoons, 162,000 Rivets, 12 gross Lead Pencils, 18 boxes Hardware, 21 dozen Iron Wrenches, 12 dozen Picks, 7 cases Hardware.

By McLean Bros & Rigg.—4½ dozen Meat Choppers, 22 dozen Thermometers, 9 dozen Cork Pullers, 48 dozen Mouse Traps, 24 dozen Wrenches, 3 cases Lampware, 12 dozen Locks, 1 dozen Store Trucks, 13 packages Lampware, 1 case Agateware, 6 dozen Handles, 84 dozen Bottle Stoppers, 27 dozen Hay Forks, 3 packages Lampware, 3 dozen Agricultural Implements, 1100 pounds Tacks, 42 gross Saws, 3 packages Platedware, 2 Scales, 9 dozen Augers, 24 dozen Gate Latches, 21 dozen Hoes, 13 packages Hardware, 37 packages Lampware, 30 boxes Belt Studs, 100 dozen Gate Latches, &c., 1½ dozen Grindstones, 30 dozen Saws, 13 Scales, 9 Emery Wheels.

By Strong & Trowbridge.—30 dozen Handles, 7 dozen Axes, 190 pounds Platedware, 12 dozen Handles, 1½ dozen Mattocks, 3 dozen Axes, 6 dozen Picks, 51½ dozen Axes, 48 dozen Handles, 36 dozen Axes, 112 pounds Stone, 3 dozen Saw Sets, 1 dozen Mangles, 30 boxes Horseshoe Nails, 3 dozen Wringers, 40 dozen Washboards, 12 dozen Handles, 6 dozen Grindstone Fixtures, 1 dozen Meat Cutters, 2 gross Hat Hooks, 4 dozen Curry Combs and Squares, 6 dozen Pulleys, 50 pounds Rivets, 7 dozen Door Springs, ½ dozen Mangles, 4½ dozen Saws, 20 dozen Locks, 3½ dozen Drills, 1 dozen Bails, 110,000 Rivets, 2 dozen Drawing Knives, 3 gross Chalk Lines, 4 dozen Lamps, 4 dozen Broilers, 2 dozen Banks, 1200 pounds Nails, 1 dozen Axes, 21 Meat Choppers, 365 pounds Emery Wheels, 116 pounds Twist Drills, 4620 pounds Emery Wheels, 1½ dozen Planes.

By Russell and Erwin Mfg. Company.—15 cases Hardware.

PER SHIP GLENESLIN, FEBRUARY 17, 1890, FOR SYDNEY, AUSTRALIA.

By F. B. Wheeler Company.—5000 feet Speaking Tubes, 8 dozen Wringers, 2 dozen sets Irons, 2 dozen Hose Nozzles, 1 case Hardware, 24 pairs Hames, 100 dozen Axes, 90 rolls Wire Cloth.

By W. K. Freeman.—4 cases Corn Mills, 10 dozen Handled Axes, 24 dozen Picks, 10 Lawn Mowers.

By McCoy & Sanders.—3 cases Handles.

By McLean Bros. & Rigg.—1 dozen Transom Lifters, 12 dozen Axe Handles, 6 cases Lampware, 24 dozen Tacks, 1 dozen Scythe Snaths, 3 Boring Machines.

By P. D. Ackermann & Bro.—84 barrels Plated Ware.

By H. A. Rogers.—2934 pounds Copper Rivets, 510 pounds Glue, 100 feet Belt Lacing.

By Morris, Strouse & Co.—120 dozen Axe Handles, 25 dozen Washboards.

By S. Oppenheimer & Co.—4 boxes Hardware.

By E. W. Harrison.—5 cases Pumps, 10 dozen Shovels, 60 dozen Handles, 1 box Pipe Cutters.

By Edward Miller & Co.—50 packages Lampware.

By Robert Gair.—4 cases Lamp Goods.

By J. H. B. Douglas.—57 Pumps.

By B. F. Avery & Sons.—5 Harrow Frames, 226 Flows and 58 Wheels.

By Winchester Repeating Arms Company.—10 Guns, 24 Pistols.

By J. A. Gifford.—4 dozen Brushes, 1 package Saddlers' Tools.

By Healy & Earl.—1 Centrifugal Reel, 2 boxes Grain Mills, 12 packages Engine Parts, 3 cases Drilling Machinery, 1 case Saws, 7 cases Wood-Working Machinery, 1 case Hardware.

By Fairbanks & Co.—4277 pounds Scales.

By Welsh & Lea.—7 cases Iron Bolts.

By J. L. Mott Iron Works.—7032 pounds Stoves and Parts.

By Collins & Co.—45 dozen Handled Axes.

By R. W. Forbes & Son.—5 packages Hardware, 10 dozen Axes, 4½ dozen Lanterns, 3 packages Hardware, 1 Corn Planter, 7 packages Mowers, 12 boxes Scales, 11 boxes Lining Nails, 2 cases Lampware, 1 case Horse Hoes, 3 racks Churns, 3 packages Kitchen Utensils, 1 case Scrapers, 2 packages Cob Mills, 4 cases Castings, 1 case Lining Nails, 46 packages Plated Ware, 1 box Hardware, 23 packages Hardware.

## REVIEW OF THE WHOLESALE MARKET IN PAINTS AND OILS.

*It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.*

### Paints and Colors.

Unfavorable weather conditions have operated to restrict business to some extent through checking outdoor work and thus reducing the demand for goods for immediate consumption. Otherwise there has been no change in the market for Paints and Colors. Manufacturers calculate upon a good spring business and jobbers take equally as favorable a view of the situation. The vast amount of building operations certain to be undertaken in this and neighboring cities within the next 30 days insures a large trade with near-by customers. Apart from this, encouraging reports are received from salesmen on the road and from agencies in other cities. Competition is keen, but several branches of the trade are in better shape at the present time than they were a year ago; prices are steadier nearly all along the line and the position of the market for most crude materials, to say nothing of the more compact nature of the several combinations of manufacturers, leaves little chance of any movement of values except in the upward direction during the spring season.

**White Lead.**—Manufacturers report a fairly good seasonable trade in pure White Lead, and jobbers state that their sales of the pigment have been well up to expectations. For this class of goods prices are firmly maintained, despite the irregularity on adulterated Lead and the extra efforts put forward by manufacturers of the same to sell the goods, sometimes on their merits, often as pure Lead. The adulterated article varies in price all the way from 4¢ to 6½¢ @ lb. If recognized authorities are to be depended upon very few of these cheap Leads are fit for any work save priming; where endurance may be a desideratum they are useless. The chief adulterant is Barytes, an earthy substance, devoid of adhesive or enduring qualities, heavier than Lead in weight and without commercial value except as an adulterant. For that use it brings 1¢ @ 1¢ @ lb. Analyses of the inferior Leads, made and distributed among the trade under the auspices of manufacturers of pure Lead, give some remarkable exhibits. A list of 50 of these analyses gives results, of which the following is a summary:

Baryta.....	30.80 @ 86.57 per cent.
Oxide Zinc.....	7.10 @ 73.77 "
White Lead.....	none @ 53.66 "

Thirteen analyses show no Lead whatever, the pigment having been made of Baryta and Zinc exclusively. Only 5 showed 40 % more of lead; 11, 30 @ 40 %; 9, 12½ @ 25 %, and 12, less than 12 %. In this is the whole secret of "cheap" White Leads. They cost the manufacturer 1½¢ @ 2½¢ @ lb. Pure White Lead costs 5½¢ @ 5½¢. Their actual value on a building is relatively as wide apart—that is, if recognized authorities are to be believed.

**Zincs and Colors.**—There have been no changes in prices of American or foreign

Oxide Zinc, and the general situation of the market is much the same as noted for several weeks, with demand running fairly. The staple lines of Colors are also without radical change and sell in the routine way to a fairly good aggregate.

**Miscellaneous.**—Block Chalk on the spot remains firm in the absence of any considerable addition to the supply. Whiting is barely steady at old prices, but has fair sale. Paris White is moving in about the usual way and remains quite steady.

### Animal and Vegetable Oils.

In this branch of trade there has been little if any movement that is out of the commonplace line. The variations in prices are few and unimportant, the transactions in most branches have continued on the hand-to-mouth order as a rule, while the general demand affords no evidence of any material change in the extent or character of buyers' wants for either home trade or export account. Where crude materials came into play as a factor in shaping the course of prices for Oils, the indications are of higher rather than reduced cost. This is particularly the case with Linseed, and applies, in a less degree, however, to Cotton-Seed and Lard. The several productions are at present selling at prices close to a parity of bare cost of the crude materials, and the tendency of the latter is in the direction of a higher level. However, the supply of Oils generally appears fully ample for all present wants, and with no speculative interest manifested, radical fluctuations in the immediate future are considered as improbable.

**Linseed Oil.**—City brands are very firmly held at 61¢ for domestic and 63¢ for Calcutta seed raw Oil and the closest buyers are unable to do better than 59¢ on out-of-town brands. High cost of raw material is still the chief factor in keeping prices up, but the demand for Oil is good and the position a strong one from the supply and demand point of view. Pure Oil, as a matter of fact, is selling to fully the average extent, despite the natural tendency of high cost to encourage the use of adulterants and substitutes.

**Lard Oil.**—The market is somewhat firmer. City pressers still let prime quality go at 51¢, but a limit is placed upon the quantity and a disposition is manifested to stand out for better figures in view of the condition of the market for raw Lard and the small amount of out-of-town brands offered.

**Cotton-Seed Oils.**—Crude is rather firmer, although without quotable change, there being a very fair demand, while only moderate quantities have arrived here unsold. In the refined products there has been little doing apart from ordinary sales of moderate-sized lots and prices are without change.

**Menhaden Oils.**—About 1300 barrels of crude have been sold at full prices and the market is firm, without, however, any advance in prices. The pressed and bleached products and Bank and Straits Oils are selling steadily in a jobbing way at previous figures.

**Sperm and Whale Oils.**—There has been no movement of crude Oils here or in the New Bedford market, but the refined are selling to about the usual extent and remain firm at old quotations.

**Olive Oil.**—Italian, in barrels, is very firm at 92½¢ @ 95¢. The high cost restricts sales somewhat, yet a fair business is passing and the stock coming forward appears to be closely absorbed.

**Cocoonut Oils.**—Ceylon and Cochin remain practically the same as last quoted, but the demand runs light and stocks in store are still quite extensive, leaving the situation somewhat in buyers' favor.

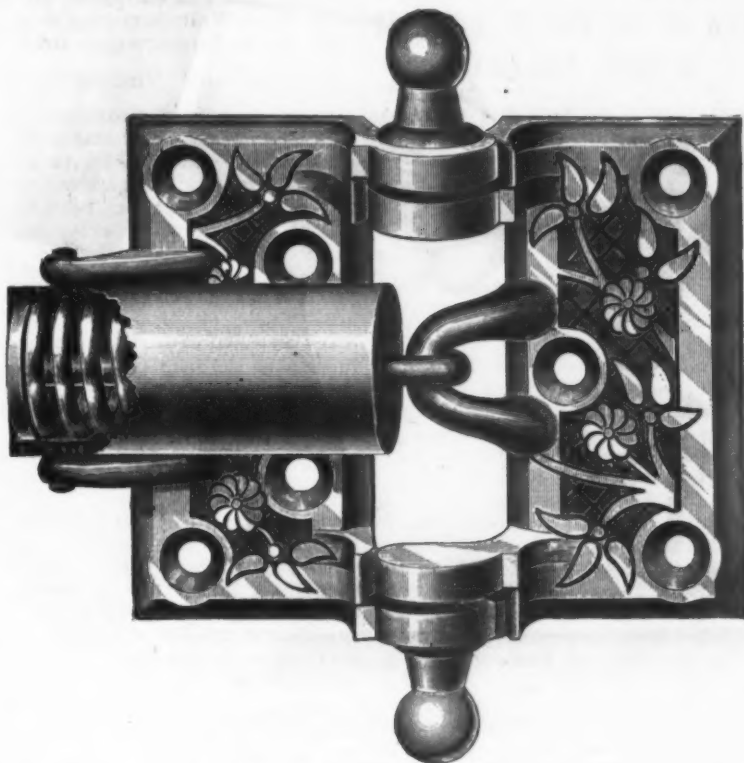


**Matchless Hold-Back Spring Hinge.**

In the illustration herewith given we represent the Matchless Hold-Back Spring Hinge, which is put on the market by E. C. Stearns & Co., Syracuse, N. Y., who have applied for a patent on it. The cut represents the hinge full size and

tempered and finished in a thorough manner. The manufacturers also direct special attention to the finish, which is referred to as superior to that of other hammers on the market. Particular attention has been given to the handles in regard to shape, elasticity and hang. The hammers are made in four sizes,  $\frac{1}{2}$ ,  $\frac{3}{4}$ ,  $1\frac{1}{2}$  and  $1\frac{3}{4}$

and finely finished in nickel. The screw works on ball-bearings, and the point is made that it has no cogs, racks or springs to get out of order. The extractor is made with clamp, as shown herewith, or with base to screw on, as may be preferred, and can be quickly attached to or detached from a counter or sideboard. All parts are interchangeable, and it is stated that any person with but little mechanical ability can insert any broken part, though the machine is not liable to get out of order. The elegance of finish of the ma-



*Matchless Hold-Back Spring Hinge.*

indicates clearly its construction. The tension of this spring hinge is produced by the compression of the ordinary form of coil spring. The engraving presents a broken view of the cylinder, thus showing the position and action of the spring. The cylinder is hung on pivots, allowing it to oscillate and keeping the strain on the spring in a direct line. It also protects the spring from the weather. The hinge is described as simple in construction and made extra heavy, with no light parts to break and get out of order. It may be used on right or left hand doors. The strength and durability of this hinge are also emphasized by the manufacturers. The goods are packed one dozen pairs in a box and one gross pairs in a case.

**Machinists' Hammer.**

The accompanying illustration represents a machinists' hammer which is being put on the market by the Billings & Spencer

pounds. This line of goods is put on the market to meet the call for such a Hammer, and is sold at a higher price than others, which is referred to, however, as justified by the superior quality.

**Smith's Patent Palace Cork Extractor.**

The Chicago Nickel Works, 95 Ohio street, Chicago, Ill., are putting on the market the above-named article, which is represented in the accompanying illustrations in position for use. It will be perceived that this extractor is different in appearance from others on the market. The simplicity of its construction and the ease with which it may be operated are referred to by the makers. In use the neck of the bottle is pressed into the mouth of the device and in line with it. The lever shown is then pulled sharply forward, which motion rotates the screw into the cork. Pushing the lever back to its former position draws the cork and reverses the



*Billings & Spencer Co.'s Machinists' Hammer.*

Company, Hartford, Conn. It is offered to meet the demand for an article of superior quality, and is described as drop forged from the best tool steel, carefully

screw. At the same time the cork is thrown off and the machine is again ready for use. The appliance is described as made of gun metal with ebony or mahogany



*Smith's Patent Palace Cork Extractor.*

chine and its durability and satisfactory working are points referred to by the manufacturers.

**Cleveland Fence Wire Tightener and Automatic Tension Governor.**

The Cleveland Fence Company, Indianapolis, Ind., are manufacturing and putting on the market the device represented herewith, the cut showing it in position on a post. The feature of the appliance to which particular attention is directed is indicated in the title above—namely, that the tension is supplied automatically. The manner in which this is accomplished is very simple. In applying the tightener to a post a  $\frac{1}{2}$ -inch hole is bored in the post through which the wire is passed. The wire is then passed through the hole A shown in the engraving and the slot B in the winding bolt. The nut shown at C is next turned with an ordinary wrench until the wire is taut, when the nut indicated at D is turned until the ratchets, owing to the pressure of the coiled spring, will hold the wire securely. After the wire is once tightened it is stated that it does not require watching and letting out when the weather becomes cold to prevent breaking, as the governor working on the ratchet and spring lets out the wire one-sixth of a round of the spindle shown at a time, when it fastens itself firmly again. The points are thus made that the wires cannot break and sagging is prevented. The efficiency with which wires can be stretched tightly and quickly by the use of this.

contrivance is also emphasized. It is explained that in putting up wire fence with it the corner posts may be placed 80 rods apart, where the ground is fairly level. This is referred to as a longer distance than is possible in the use of other stretchers, and the saving in time and posts is thus urged. It is further stated that corners will not pull or raise out of the ground where this stretcher is employed, as it lets itself out automatically, as already

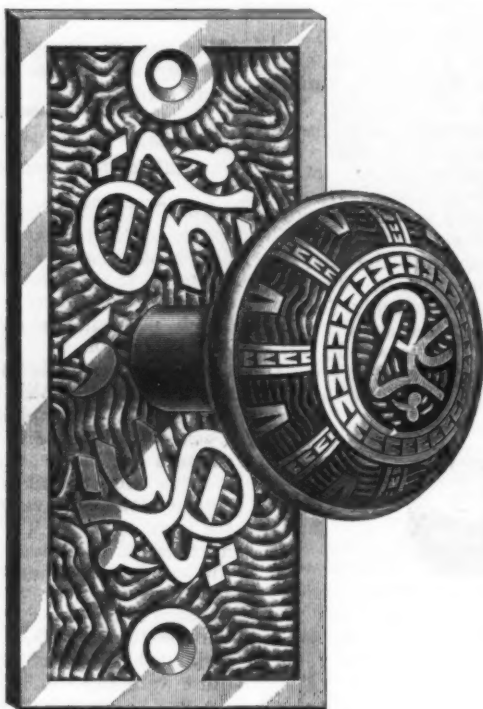


*Cleveland Fence-Wire Tightener and Automatic Tension Governor.*

pointed out, without any assistance when the wires contract, thus permitting the corners to retain their former position. Intermediate posts may be placed as far as five rods apart, as the wires are easily kept tight and in place by the continued action of the tightener and a new iron foot-stay, which can be obtained from the manufacturers. The tightener may be used with barb, plain or ribbon wire. The strength and durability of the fence erected by this appliance are referred to by the manufacturers, in addition to the other advantages to which allusion is above made.

#### A New Design.

The Mallory-Wheeler Co., New Haven, Conn., and 64 Reade street, New York,



*Mallory-Wheeler Co.'s New Design.*

are about putting on the market a new design in locks, door trimmings, &c. It is known as the B design, and is represented in the accompanying illustration.

The characters which appear in it are Arabic, and were copied, we are advised, from illustrations by Owen Jones of the decorations of the Alhambra. This design has met with much commendation

by them to watered silk. All ornamental bronze front locks described in the company's 1882 catalogue can be furnished in the design herewith illustrated. An appendix just issued by the company



*Walker's Table Lemon Squeezer.*

from persons of culture and with artistic leanings, and it is thought that this change from existing styles, though a somewhat radical one, will meet with favor among dealers and architects. In connection with this design the company also announce a new finish, which they designate as No. 5, which can be obtained only in this design. It is described as a combination of the finishes known to

shows the design in a large variety of door and window trimmings.

#### Walker's Table Lemon Squeezer.

In the engraving herewith given we represent a new lemon squeezer recently introduced by the Erie Specialty Mfg. Company, Erie, Pa., the cut also illustrating its use. The article is designed for use on hotel, restaurant and private tables for squeezing the juice from small slices of lemon into fish, oysters, iced tea and similar dishes, and also on bars and soda fountains, for dashing a small amount of juice into beverages, &c. The entire surface is neatly plated and it thus makes a clean, neat and attractive article for the table or bar. Its construction is such as to prevent the juice from squeezing out on the clothing of the operator, the efficiency with which it squeezes a small piece of lemon being referred to. The manufacturers give the following directions in regard to the operation of the device: Cut the lemon lengthwise into eight or ten pieces. Open the squeezer and place one piece (peel side up) into the concaved side, then grip in the hand and tip it as shown in the cut, and by gradually squeezing all of the juice can be extracted and evenly distributed over a dish or into a glass. It will thus be seen that the squeezer is easily operated. It is made nickel-plated on rustless iron and silver-plated.

The order of the British Government for 50 dynamite guns from the Pneumatic Dynamite Company, of this city, will involve a cost not much under \$1,500,000. The Italian Government, it is said, is considering the question of ordering a dozen or more dynamite guns, and will also fit out a cruiser mounted with these pieces after the manner employed in the Vesuvius. At present the Pneumatic Dynamite Company is engaged in supplying the United States Government with five 15-inch guns, in addition to the two already constructed.



### The Smolley T Fence Post.

John G. Smolley, Connersville, Ind., is introducing to the trade a new form of combination fence post for farm, railroad and prairie fencing, for which several

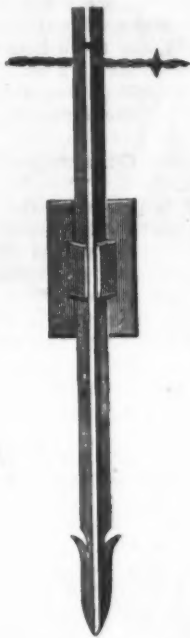


Fig. 1.—Smolley T-Iron Fence Post.

special features are claimed. The post is made of wrought T iron, in one piece,  $6\frac{1}{2}$  feet long, allowing  $2\frac{1}{2}$  feet to be driven into the ground. The forward vertical flange is provided at suitable intervals with transverse vertically curved slots, having upper horizontal openings to receive the fence wires, which are afterward clamped by the lips into their seat by a blow with a hammer, thus permanently fastening the wires to the post, which positively prevents either horizontal or lateral displacement. The post being made of wrought iron these lips can be

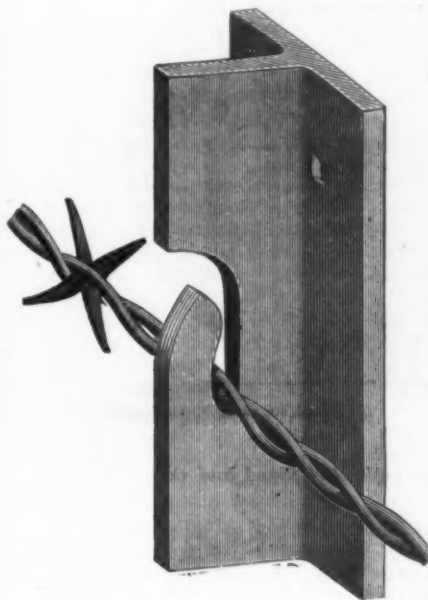


Fig. 2.—Method of Fastening Wire.

bent out for the purpose of removing the wires with any suitable instrument. The post is also provided with a harpoon point, so when driven into the ground the depth desired it cannot be raised out by frost or any other natural influences. It can only be removed by a pry or post-lifter. The method of building a fence with this post

makes it much stronger than any other fence known, for the reason that using the steel stay, having slot arranged same as on post, to clamp on the fence at suitable distances, makes the fences compact and solid, as it combines the wires in equal strength, making it as solid as a net wire fence. This allows the posts to be set at a great distance apart, and thus overcoming the contraction and expansion of the wires. It can be used for net wire or picket fencing as well as for barbed wire, and is practically as strong and indestructible. It is claimed for this post that it is an exceptionally cheap and practicable iron fence post, and that it overcomes many objections heretofore raised against others.

### Rogers' Drive Screws.

The accompanying engraving, Fig. 1, illustrates a drive screw which the American Screw Co., Providence, R. I., are now putting on the market. This article is



Fig. 1.—The Rogers Drive Screw.

designed specially for driving into wood, in view of the common practice of driving the ordinary screws at least part way with a hammer, and is so constructed that it will turn all the way into the wood under blows from the hammer, the same as the ordinary screw would if inserted from beginning to end with a screw-driver. It will be observed that the point is made with a view to such driving and the form



Fig. 2.—Manner in which Rogers Drive Screw Enters the Wood.

of the thread is best adapted to displace the wood without disintegrating the fiber and at the same time press it and make it firm and solid, giving it increased power of resistance against any strain it may be subjected to. The screw is thus referred to as in fact making its own nut. This feature is of obvious importance, especially when it is remembered how much time and money have been spent by the manufacturers of metal nuts to improve their quality and holding power. The head of the screw, it will be observed, is made with an improved nick or slot to meet the demand for a wider slot to admit a heavier screw-driver than can be used with the com-

mon cut screws, while it is strengthened at the ends of the slot to avoid the common fault of splitting the head. This construction permits the slot to be made much wider than in ordinary screws and permits also the use of a heavier screw-driver, inasmuch as the ordinary cut nick must be kept narrow to save the strength of the head. Other attempts have heretofore been made to produce drive screws, the most notable having been that of the International Screw Nail Company, Northampton, Mass., but their goods cost more to manufacture than common screws, and under the severe competition among screwmakers their manufacture was abandoned, a result which ensued from the fact that the form of screw made was defective and unsatisfactory. The American Screw Company are putting this new drive screw on the market in the confidence that it will be found adapted to the purposes for which it is intended, and that it will to a considerable extent be found suitable to take the place of the common screws. Experiments which they have

made show that the screw can be satisfactorily driven its whole length with a hammer and have a remarkable holding power, very much greater than that possessed by the common screw as ordinarily driven. The points are also made that it possesses a degree of stiffness adapted for driving with a hammer; that it can be inserted with exceptional rapidity, and has increased holding surface. The announcement of the company on page 15 gives other illustrations and mentions additional points in regard to this article. The company will be pleased to furnish samples to merchants who desire them, in the confidence that an inspection of the screw and a trial of it will convince the trade as to its exceptional merit and its adaptation for many uses. The machinery and product are covered by patents.

### An Improved Kettle Handle.

The St. Louis Stamping Company, St. Louis, Mo., have brought out an improvement in kettle handles, the accompanying illustration showing the special feature. On one side of each ear a shoulder is placed which prevents the handle of the



An Improved Kettle Handle.

kettle from touching the kettle body, the shoulder holding it in a horizontal position, as shown in the illustration. Which ever side the handle falls, there is one shoulder to support it. The advantage of this improvement is that the handle is kept cool, so that there is no danger of burning the hand when lifting a kettle from the stove. The nuisance of using a cloth to lift the kettle is also done away with.

### Cary's Universal Metal Strap.

The following illustrations represent this article and the manner in which it is put on the market, Fig. 1 giving a full-sized representation of the strap, Fig. 2 showing the manner in which the coils in which the strap is furnished are attached for use and Fig. 3 portable reel stand and coil. This strap, which is manufactured by the Cary Mfg. Company, 41 and 43 Centre street, New York, is described as made of soft steel of a superior quality, in which by stamping the bosses represented in Fig. 1 are produced. The nails are intended to



Fig. 1.—Cary's Patent Universal Box Strap.

be driven along the middle of the strap between the bosses, which protect the heads of the nails from catching. The point is also made that the bosses materially stiffen the strap and that they also strengthen the edges and keep them from catching. The material of which the strap is formed permits the use of a lighter gauge, so that there is, we are advised, three times the length of this strap to the same weight of ordinary strap iron. The fact that soft steel is used permits any kind of nail to be easily driven through it and there results a great saving of time, as no punching of holes is required. The strap is furnished  $\frac{1}{2}$ ,  $\frac{3}{4}$ ,  $\frac{1}{2}$  and 1 inch wide and is put up in coils with an iron frame,

on the coils which are intended for use in stands. It is obvious that besides the use of this strap in binding cases it is also adapted for barrel headings, shingles and various other purposes. Information as to the prices at which the strap is sold will be found in the Trade Report.

### Southern Miscellany.

Frank T. Reynolds contemplates commencing the manufacture of tacks, finishing nails, screws, shoe buttoners, hinges, small bolts and other articles of small hardware.

The Gem City Land and Improvement Company has been organized at Attalla, Ala., with a capital stock of \$300,000. This company will build two iron furnaces, a rolling mill and other plants.

The Shelby Iron Company, of Shelby, Ala., which was recently purchased by Mr. D. T. Parker, of Anniston, and other capitalists, has blown out its No. 2 charcoal furnace to put in new hearth and lining, hot blast ovens and boilers.

A new charcoal furnace is to be built at Renfro, Ala., by D. W. Rogers & Co. Its daily output will be 50 tons.

A new furnace was blown in at New Decatur, Ala., last week. The car-wheel works at the same place belonging

A factory to manufacture gimlets and other small hardware is to be started at Danville, Ky., by Russell Johnson.

The Railway Supply Company, of Birmingham, Ala., have increased their capital and will add new machinery.

The Florence Cotton and Iron Company, of Florence, Ala., have given out a contract for a new furnace. It will be 17 x 80 feet, the cast-house 50 x 175, the boiler-house 50 x 135, the stock-house 125 x 200 and the water-tower 18 x 60. The pump will raise 3,000,000 gallons a day, and the daily output of the furnace will be 200 tons.

At Cedartown, Ga., another iron furnace is to be built.

O. H. Wilt is increasing the capacity of his machine works at Sandersville, Ga.

The South Tredegar Iron Company, of Chattanooga, will put additional puddling furnaces in their rolling mill.

The foundry and machine works of C. W. Jones, at La Grange, Ga., are being enlarged.

The Golden Foundry and Machine Works, of Columbus, Ga., intend erecting a \$75,000 plant.

Parties from New York and Baltimore are prospecting in Georgia, near Lafayette Hall's Mills, with a view of purchasing mineral lands. The former are buying manganese properties.

The Manly Mfg. Company, of Dalton, Ga., intend adding new lathes and drill presses to their iron works.

At Cordele, Ga., R. G. Tomlin, R. C. Harris, J. E. S. Shipp and others have organized the Cordele Machine Shops. The company has a capital of \$15,000.

Twenty molders in the foundry of G. R. Lombard, at Augusta, Ga., struck recently because of the refusal of the pro-

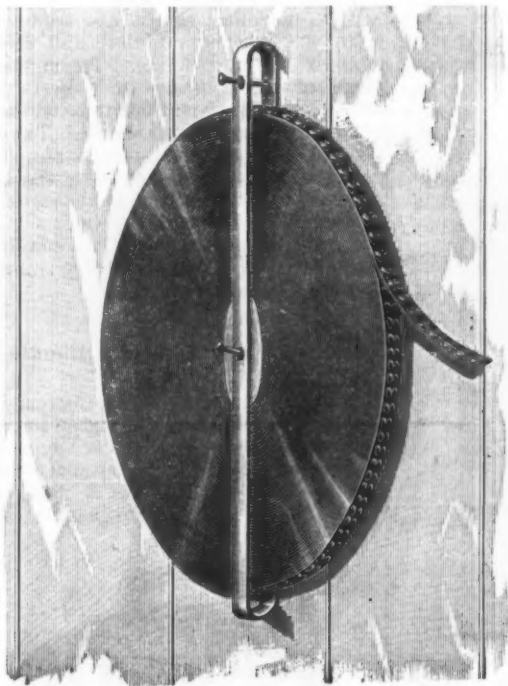


Fig. 2.—Reel Hung Up Ready for Use.

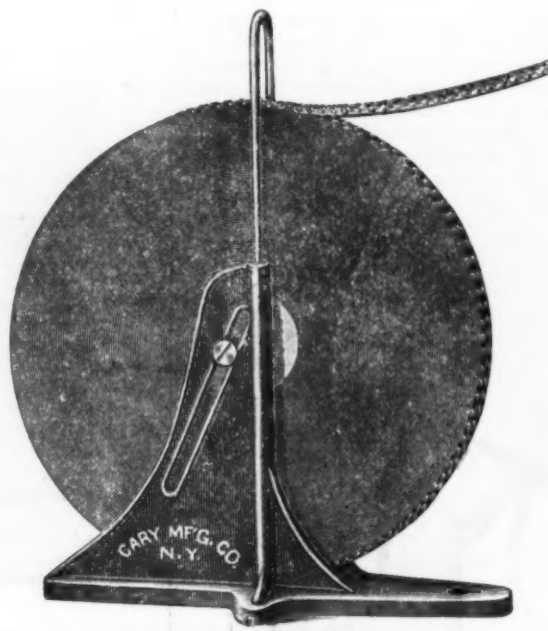


Fig. 3.—Portable Reel Stand and Coil.

as shown in Fig. 2. This frame is readily attached to the wall or other woodwork as there indicated. Each coil contains 300 feet. The fact that the strap is thus furnished in a continuous piece and in neat, compact form will be appreciated as commending it to the trade, especially as there is practically no waste in using it, as with other strap which is furnished in short lengths. For the convenience of large consumers strong and portable iron stands to hold a reel as shown in Fig. 3 can be furnished, thus permitting the strapping of packages wherever most convenient. The reel frame shown in Fig. 2 is not put

to the United States Rolling Stock Company will be enlarged, \$20,000 worth of new machinery being added. The above company also own an extensive car plant at Anniston, where another rolling mill is to be erected. The building for it will be about 100 x 150 feet and will be followed by other improvements.

The Birmingham Hardware and Manufacturing Company has added additional tack machinery. A box factory has also been added.

The Trenton Rock National Gas Mining and Mfg. Company, of Henderson County, Ky., are a newly incorporated enterprise.

prietor to discharge a non-union man, whom the men assert has been working against them. A number of men remained at work.

Mr. Covington, of New York, it is said will build a furnace at Chattanooga.

It is reported at Chattanooga that New York parties are organizing a \$1,000,000 company to buy 1000 acres of land and build car works and rolling mill.

The McMinnville, Tenn., Foundry and Machine Shops are enlarging their capacity.

The Texarkana Car and Foundry Company will add to its foundry and machine shop.



The Newton, Kansas, Tool Company proposes to move its plant to Houston, Texas, if a stock company is organized to operate it.

The Tullahoma, Tenn., Foundry and Machine Works has been organized, with H. Jacobs as president and J. H. Cordell as secretary.

The Grafton, W. Va., Foundry and Machine Company, has been chartered, with a capital stock of \$25,000.

Matthew Addy, of the firm of Matthew Addy & Co., pipe manufacturers and iron merchants, of New York and Cincinnati, has suffered from a serious accident during a recent visit to Anniston, Ala. A trunk fell from the top of a truck hitting him on the shoulder, which member was dislocated and badly bruised.

#### Last Year's Business Failures.

The year 1889 was regarded in many circles as a very fair business year. There were comparatively few industries in which some profits were not made, and many lines of business showed larger gains than any other year for some time past. It was noted further that prosperity was in a sense very evenly distributed over the country, and yet with all these favorable indications there were 11,719 business failures in the United States in 1889 as compared with 10,587 in 1888, and 9740 in 1887. The estimated liabilities of last year's insolvents were \$140,359,000, and the assets were \$70,599,000, against \$120,242,000 liabilities and \$61,999,000 assets for the failures of the previous year. Thus, says the *Journal of Commerce*, the failures in 1889 were more in number and far greater in liabilities than for 1888, and the proportion of assets to the obligations shows that the total insolvency was more disastrous. Why in a season free from blighting frosts or withering droughts, and the most abundant yield from field, forest and mine, so many in business have gone to the wall, no one seems able to answer.

Our contemporary in investigating the cause of this alarming condition of affairs finally points out that the difficulty in the attempts at a solution of the problem is in the method of application, and asserts that the secret of human action is not to be discovered by looking at mankind in the mass, but by examining the individual, and then continues: "It is said that in nearly 12,000 failures in business, extending through so great a variety of undertakings as are represented among the insolvents, there can be no general law applicable to all, we answer that this is begging the question, and is refuted by a careful study of particular cases. In the wrecks on the high seas the incidents of the several disasters vary widely, but they may all be classified in a few brief terms, one or more of which apply to every loss. The winds and the waves are the external forces and the smoldering fires and hiding fog complete the record. There are some business firms that go to pieces from dry rot, as there are old vessels that sink in mid ocean or at the dock, with no threatening wind or tossing waves, because the strength of the hull has been eaten out. Houses of this character go on year after year with a gradual wasting away of the trade which was once profitable, until the disintegration is inevitable and is a mere question of time. But these are exceptions to the general rule."

The two prime causes for business failures at the present time, our contemporary concludes to be the excessive cost of conducting business enterprises and the tendency to engage in speculation. Concerning the former it is said: "Palatial warehouses, luxurious fittings, costly instrumentalities and heavy drains for the private

purse of the manager or his partners eat out too much of the capital. A large part of modern trade, even where it is legitimate, is conducted too much at arm's length. An army of traveling salesmen at vast expense are employed to distribute the goods that are sold, while the competition in this direction is so great that the gross profits are much too small for their support." With respect to the latter there is the following: "A man who tries to live by the effort to get something for nothing will certainly come to grief. It might be supposed that in a circle who live by gaming, for speculation is only this and nothing more, some one would pocket the winnings, so that while the many are impoverished the lucky, the skillful or the shrewd trickster would carry away the spoils. This is the aim of the speculator. But what none in the ring seem to understand is that the process itself is one wherein there is an enormous waste. In legitimate trade each turn of the goods, other things being equal, adds to their value. If this is not true in every change of hands it is the general law, and it is the possibility that all who are participants in the deal may realize something out of it, which makes the distinction between lawful barter and gambling. In the latter all that is gained in one pocket is inevitably an equal and positive loss to some other purse. While this is going on all who are engaged are in some way more or less direct seeking to live out of the stakes."

A recent visit to the works of the Midgley Wire Belt Company, of Beaver Falls, Pa., by a representative of *The Iron Age* revealed an encouraging state of affairs. Their plant is now being operated to its full capacity and orders are being received from all over the country. Two years ago the firm placed an 8-inch wire belt in the saw works of Emerson, Smith & Co., at that place, and it is in as good condition to-day as when first put up. It supplanted a 10-inch 6-ply gum belt and has been satisfactory in every respect. It will be remembered that the Midgley concern purchased the belt which drove the machinery in the Paris Exposition of last year. The belt has since been sold to a large concern in England and is still doing duty. The Midgley wire belt is now being made in that country under license by Johnson & Son, of Manchester, who report a good demand for it.

British manufacturers, it has been charged, are suffering more and more from competition on the European continent, more particularly in Germany, and it is intimated that loss of trade in this direction is liable to become permanent. A London correspondent of one of the Sheffield papers tacitly concedes the truth of the allegation. The chief concern in England, however, arises from the multiplication of technical schools on the Continent at various points—not institutes and colleges, but simply mills and workshops established "for the purpose of communicating England's manufacturing secrets" and instructing foreigners in quickness of eye and deftness of hand. The lessons are practical and the schools are profitable. The correspondent says: "We hear much boasting of the progress the nations of Europe are making in rendering their people independent of our mills and workshops. This boast is not unfounded. Our Continental customers that were are to-day our rivals. True, they take our coal, our iron, our reshipped raw material. They take, also, such manufacturing machinery as they have not learned how to make for themselves, and when they get it they mold from it and reproduce the like of it in their own workshops. We import that which we used to make; we take the

bread of the children and cast it to strangers." But England, with her marvelous resources and arms that encircle the globe, would appear to be well secured in every direction.

Engineer Walter Katte contends that a tunnel under the Harlem river is impossible, that the expense would be "well up in the millions," and all the Harlem improvements already made would be rendered useless.

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# CURRENT HARDWARE PRICES.

MARCH 5, 1890.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

## Adjusters, Blind.

Domestic..... \$ doz \$3.00, 33½¢  
Excelior..... \$ doz \$10.00, 50¢10¢25¢  
Washburn's Self-Locking..... 20¢20¢10¢

## Ammunition.—

Caps, Percussion, 1000—  
Hicks & Goldmark's and Union Metallic Cartridge Co.  
F. L. Waterproof, 1-10's..... 34¢35¢  
E. B. Trimmed Edge, 1-10's..... 46¢48¢  
E. B. Grud. Edge, Cent. Fire, 1-10's..... 46¢47¢  
Musket Waterproof, 1-10's..... 50¢  
G. D..... 23¢  
S. B. Genuine Imported..... 45¢  
Eley's E. B..... 54¢ @ 55¢  
Eley's D Waterproof, Central Fire..... \$1.50

Cartridges—  
Rim Fire Cartridges..... 50¢52¢  
Rim Fire Military..... 15¢2¢  
Cent. Fire, Pistol and Rifle..... 25¢52¢  
Cent. Fire, Military and Sporting..... 15¢52¢

Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.  
Blank Cartridges, 22 cal., \$1.75..... 2¢  
Blank Cartridges, 32 cal., \$3.50..... 2¢  
Primed Shells and Bullets..... 15¢42¢  
B. B. Caps, Round Ball, \$1.75..... 2¢  
B. B. Caps, Con. Ball, Swgd., \$2.00..... 2¢

Primers—  
Berdan Primers, \$1.00..... 3¢  
B. L. Caps (for Sturtevant Shells) \$1.00..... 3¢  
All other Primers, \$1.20..... 3¢

Shells—  
First quality, 4, 8, 10 and 12 gauge..... 25¢10¢3¢  
First quality, 14, 16 and 20 gauge..... 10¢  
Star, Club, Rival and Climax brands..... 20¢15¢2¢

Seibold's Comb. Shot Shells..... 15¢2¢  
Brass Shot Shells, 1st quality..... 60¢2¢  
Brass Shot Shells, Club, Rival, Climax..... 65¢2¢  
I X L, 10 and 12 gauge..... 40¢52¢  
"Special," 16 gauge..... 30¢15¢25¢  
"Special," 10 and 12 gauge..... 40¢10¢  
Fowler's Pat..... \$3.25

Shells Loaded—  
Standard, List..... 40¢40¢10¢5¢

Wads—Price per M.  
U. M. C. & W. R. A.—B. E., 11 up..... 68¢  
U. M. C. & W. R. A.—B. E., 9 to 10..... 82¢  
U. M. C. & W. R. A.—B. E., 8..... 94¢  
U. M. C. & W. R. A.—B. E., 7..... 110¢  
U. M. C. & W. R. A.—P. E., 11 up..... 115¢  
U. M. C. & W. R. A.—P. E., 9 to 10..... 150¢  
U. M. C. & W. R. A.—P. E., 8..... 170¢  
U. M. C. & W. R. A.—P. E., 7..... 180¢  
Eley's B. E., 11 up..... \$1.75  
Eley's P. E., 11 to 20..... 2.80

Anvils.—  
Eagle Anvils, \$ 10¢..... 15¢15¢5¢  
Peter Wright's..... 10¢4¢  
Armstrong's Mouse Hole..... 9¢  
Armstrong's Mouse Hole, Extra 11½¢11½¢  
Trenton..... 9¢10¢  
Wilkinson's..... 9¢10¢  
J. & Riley Carr. P. Solid..... 11¢4¢10¢  
Moore & Barnes Mfg. Co..... 33½¢

Anvil Vise and Drill—  
Millers Falls Co., \$18.00..... 20¢  
Cheyney Anvil and Vise..... 25¢  
Allen Anvil and Vise, \$3.00..... 40¢10¢  
Star..... 45¢5¢

Apple Parers—See Parers, Apple, &c.

Augers and Bits—  
Douglass Mfg. Co..... 70¢  
Wm. A. Ives & Co..... 70¢  
Humphreysville Mfg. Co..... 70¢  
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.)..... 70¢  
Rockford Bit Company..... 55¢  
Cook's, Douglass Mfg. Co..... 55¢  
Cook's, N. H. Copper Co. 50¢10¢50¢10¢5¢  
Ives' Circular Lip..... 60¢  
Patent Solid Head..... 30¢  
C. E. Jennings & Co., No. 10, extension lip..... 40¢  
C. E. Jennings & Co., No. 30..... 60¢  
C. E. Jennings & Co., Auger Bits, # set, 32½ quaters, No. 5, \$5; No. 30, \$3.50, 20¢  
Lewis' Patent Single Twist..... 50¢  
Russell Jennings' Augers and Bits, 25¢10¢  
Imitation Jennings' Bits..... 60¢60¢5¢  
Snell's Jennings Pattern..... 20¢  
Pugh's Black..... 20¢  
Rockford, Jennings' Pattern..... 60¢  
Car Bits, P. S. & W. Co..... 60¢10¢  
Snell's Car Bits..... 60¢  
L. Hommedieu Car Bits..... 15¢10¢  
Worster's Pat. Auger Bits..... 10¢  
Cincinnati Bell-Hangers' Bits..... 20¢

Bit Stock Drills—  
Morse Twist Drills..... 50¢10¢5¢  
Standard..... 50¢10¢5¢  
Cleveland..... 50¢10¢5¢  
Syracuse, for wood (wood lat.) 30¢30¢5¢  
Syracuse, for metal, 50¢10¢10¢  
Williams' or Holt's, for wood..... 40¢10¢  
Cincinnati, for wood..... 30¢5¢  
Cincinnati, for metal..... 40¢10¢

Expansive Bits—  
Clark's small, \$18; large, \$26..... 35¢35¢5¢  
Ives' No. 4, \$ doz 60¢..... 40¢  
Swan's, No. 1, \$20; No. 2, \$22..... 35¢  
Stearns' No. 2, \$48..... 20¢

Gimlet Bits—  
Common..... \$ gross \$2.75 @ \$3.25  
Diamond..... \$ doz \$1.10..... 25¢10¢  
"See"..... 25¢25¢5¢  
Double Cut Shepards..... 45¢45¢10¢

Double Cut, Ct. Valley Mfg. Co..... 30¢10¢  
Double Cut, Hartwell's, # gro..... 35¢25¢  
Double Cut, Douglass'..... 40¢10¢  
Double Cut, Ives'..... 60¢60¢10¢

Hollow Augers—  
Ives..... 33½¢  
French, Swift & Co..... 33½¢10¢  
Douglass'..... 40¢10¢  
Bonney's Adjustable, # doz \$48..... 40¢10¢  
Stearns'..... 20¢10¢  
Ives' Expansive, each \$4.50..... 50¢5¢  
Universal Expansive, each \$4.50..... 20¢  
Wood's..... 25¢25¢10¢  
Cincinnati Adjustable..... 30¢30¢5¢  
Cincinnati Standard..... 25¢10¢

Ship Augers and Bits—  
L. Hommedieu's..... 15¢10¢15¢10¢5¢  
Watrous'..... 15¢10¢15¢10¢10¢  
Snell's..... 15¢10¢15¢10¢5¢  
Snell's Ship Auger Patt'n Car Bits..... 15¢10¢15¢10¢5¢

Awl Haft—See Hafts, Awl.

Awls, Brad Sets, &c—  
Awls, Sewing, Common # gr \$1.70, 35¢  
Awls, Should. Peg. # gr \$2.45, 40¢40¢10¢  
Awls, Pat. Peg. # gr 65¢..... 40¢40¢10¢  
Awls, Shouldered Brad, 2.70 # gr..... 45¢  
Awls, Handled Brad, # gr, \$7.50, 35¢10¢  
Awls, Handled Scratch # gr, \$7.50, 35¢10¢  
Awls, Socket Scratch, # doz, \$1.50, 25¢30¢

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—  
Makers' and Special Brands—  
First quality..... \$ doz \$6.00 @ \$6.50  
Others..... \$ doz \$5.50 @ \$5.75

Axle Grease—See Grease, Axle.

Axles—  
No. 1, 4¢ @ 5¢, No. 2, 5¢ @ 6¢45¢  
Nos. 7 to 14..... 47½¢  
Nos. 15 to 18..... 47½¢ 3¢ cash  
Nos. 19 to 22..... 70¢  
National Tubular Self-Oiling: Standard Farm (1 to 5) and Special Farm (A1 to A5):  
Less than 10 sets..... 33½¢  
Over 10 sets..... 33½¢5¢

Bag Holders.—See Holders, Bag.

Balances—  
Spring Balances..... 50¢  
Common 24-lb..... \$ doz \$1.50..... 60¢  
Chattillon's Spring Balances..... 50¢  
Chattillon's Circular Spring Balances, 60¢

Bars.—  
Crow—  
Cast Steel..... \$ 41¢  
Iron, Steel Points..... \$ 39¢

Basins, Wash—  
Standard Fiberware, No. 1, 10½-inch, \$3; 12-inch, \$2.25; 13½-inch, \$2.75; 15-inch, \$3.25.

Beams, Scale—  
Scale Beams, List Jan. 12, '82..... 50¢10¢  
Chattillon's No. 1..... 40¢  
Chattillon's No. 2..... 50¢

Beaters, Egg, &c—  
Keystone, P. D. & C., Each, No. 1, \$1; No. 2, \$2..... 25¢  
Dover..... \$ doz \$1.50..... 25¢  
National, # doz \$4.50..... 33½¢  
Family (T. & S. Mfg. Co.), # gro \$17.00..... \$18.00

Duplex (Standard Co.)..... \$ doz \$1.25  
Rival (Standard Co.)..... \$ doz \$1.00  
Duplex Extra Heavy (Standard Co.)..... \$ doz \$1.00

Triumph (T. & S. Mfg. Co.), # gro \$10.50 @ \$11.50  
Advance, No. 1..... \$ gro \$10.50  
Advance, No. 2..... \$ gro \$10.00  
Bryant's..... \$ gro \$14.00  
Avery's Spiral..... \$ gro \$5.00  
Double (H. & R. Mfg. Co.)..... \$ gro \$16.20  
Easy (H. & R. Mfg. Co.)..... \$ gro \$14.00  
Triple (H. & R. Mfg. Co.)..... \$ gro \$16.20  
Spiral (H. & R. Mfg. Co.)..... \$ gro \$4.50  
Palme, Diehl & Co.'s..... \$ gro \$24.00

Bells—  
Cow—  
Common Wrought..... 60¢10¢  
Western..... 60¢10¢  
Western, Sargent's List..... 70¢10¢  
Kentucky, "Star"..... 20¢10¢  
Kentucky, Sargent's list..... 70¢10¢  
Dodge, Genuine Kentucky..... 70¢70¢10¢  
Texas Star..... 50¢10¢50¢10¢5¢  
Call..... 40¢40¢25¢  
Farm Bells..... \$ 36¢33¢  
Steel Alloy Church and School Bells, 40¢

Door—  
Gong, Abbe's..... 63½¢10¢  
Gong, Yankee..... 45¢10¢  
Gong, Barton's..... 40¢10¢60¢  
Crank, Taylor's..... 25¢10¢  
Crank, Brooks'..... 50¢10¢25¢  
Crank, Cone's..... 10¢  
Lever, Sargent's..... 20¢10¢  
Lever, Taylor's Bronzed or Plated..... net  
Lever, R. E. M. Co.'s..... 50¢10¢25¢  
Full, Brook's..... 50¢10¢25¢  
Full, Western..... 25¢10¢

Electric, Wollensak's..... 20¢  
Bigelow & Dowse..... 20¢  
Taylor's..... 20¢

Hand—  
Light Brass..... 70¢10¢ @ 75¢  
Extra Heavy..... 60¢10¢

White Metal..... 60¢10¢10¢  
Silver Chime..... 33½¢10¢  
Globe (Cone's Patent)..... 25¢10¢35¢

Bellows—  
Blacksmiths'..... 60¢60¢5¢  
Molders'..... 40¢40¢10¢  
Hand Bellows..... 40¢10¢50¢

Belting, Rubber—  
Common Standard..... 70¢10¢  
Standard..... 70¢70¢5¢  
Extra..... 60¢5¢60¢10¢  
N. Y. B. & P. Co., Carbon..... 60¢10¢8¢  
N. Y. B. & P. Co., Diamond..... 50¢10¢

Bench Stops—See Stops, Bench.

Benders, Upsetters, Tire—  
Stoddard's Lightning Tire Upsetters..... 15¢  
Detroit Perfected Tire Bender..... 15¢

Bits—  
Auger, Gimlet, Bit Stock, Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—  
Ordinary Tackle, list May 20, 1889..... 50¢  
Cleveland Block Co., Mal. Iron..... 50¢  
Moore's Novelty, Mal. Iron..... 50¢

Bolts—  
Carriage, Machine, &c.—  
Corn, list June 10, '84..... 70¢12¢25¢  
Genuine Eagle, list Oct. '84..... 75¢10¢80¢  
Phil. pattern, list Oct. 7, '84..... 50¢80¢10¢  
R. B. & W., old list..... 70¢  
Machine, list Jan. 1, 1890..... 75¢10¢  
Bolt Ends, list Jan. 1, 1890..... 75¢10¢

Door and Shutter—  
Cast Iron Barrel, Square, &c. 70¢70¢10¢  
Cast Iron Shutter Bolts..... 70¢70¢10¢  
Cast Iron Chain (Sargent's list)..... 65¢10¢  
Ives' Patent Door Bolts..... 60¢  
Wrought Barrel..... 70¢70¢10¢  
Wrought Square..... 70¢70¢10¢  
Wrt Shutter, all Iron, Stanley's..... 60¢10¢  
Wrt Shutter, Brass Knob..... 40¢10¢  
Wrt Shutter, Sargent's list..... 60¢10¢  
Wrt Sunk Flush, Sargent's list..... 55¢10¢  
Wrt Sunk Flush, Stanley's list..... 55¢10¢  
Wrt B.K. Flush, Com'n..... 55¢10¢

Stove and Plow—  
Stove..... 60¢  
Plow..... 60¢5¢  
R. B. & W. Plow..... 55¢

Tire—  
Common, list Feb. 28, '83..... 65¢  
Port Chester Bolt and Nut Company: Empire, list Feb. 28, '83..... 65¢  
Keystone, Philadel., list Oct. '84..... 80¢  
Norway, Phil., list Oct. '84..... 75¢  
American Screw Company: Norway, Phil., list Oct. 16, '84..... 75¢  
Eagle, Phil., list Oct. 16, '84..... 80¢  
Philadel., list Oct. 16, '84..... 80¢  
Bay State, list Feb. 28, '83..... 65¢  
R. B. & W., Philadel., list Oct. 16, '84..... 80¢

Borers, Tap.—  
Common and Hind..... 20¢10¢  
Ives' Tap Borers..... 33½¢5¢  
Enterprise Mfg. Co..... 20¢10¢30¢  
Clark's..... 33½¢35¢

Borax..... \$ 9¢ @ 10¢4¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.—  
Per b..... 24¢

Braces—  
Amidon's..... 75¢10¢ @ 80¢  
Barker's Imp'd Plain..... 65¢10¢70¢  
Barker's Imp. Nickel..... 75¢10¢80¢  
Ratchet..... 60¢60¢10¢  
Eclipse Ratchet..... 60¢  
Globe Jawed..... 40¢40¢10¢  
Corner Brace..... 40¢40¢10¢  
Universal, 8 in., \$2.10 10 in., \$2.25  
Buffalo Ball..... \$1.10 @ \$1.15  
P. S. & W. Co., Peck's Patent..... 60¢

Barber's, Nos. 10 to 15..... 50¢  
Nos. 30 to 33..... 50¢  
Nos. 40 to 63..... 50¢10¢  
Nos. 8, 10 and 12..... 75¢10¢ @ 80¢  
Plated, Nos. 8, 10 and 12..... 65¢10¢70¢  
Nos. 25, 27 and 30..... 50¢10¢ @ 60¢5¢  
Nos. 117, 118, 119..... 70¢70¢5¢  
Common Ball, American..... \$1.00 @ \$1.10  
Ives' New Haven Novelty..... 70¢70¢5¢  
New Haven Ratchet..... 60¢60¢10¢  
Barber Ratchet..... 60¢5¢60¢10¢  
Barbers..... 60¢5¢  
Spofford..... 60¢5¢60¢10¢  
Osgood's Ratchet..... 40¢10¢50¢  
Spofford's..... 50¢5¢50¢10¢

Brackets—  
Shelf plain, Sargent's list, 55¢10¢ @ 55¢  
Shelf, fancy, Sargent's list, 60¢10¢ @ 60¢  
Reading, plain..... 50¢10¢ @ 60¢10¢5¢  
Reading, Rosette..... 60¢10¢ @ 60¢10¢10¢

Bright Wire Goods—See Wire.

Broilers—  
Hen's Self-Inch..... 9 10 9x11  
Basting..... \$ Per doz \$4.50 5.50 6.50

Buckets—See Well Buckets and Pails.

Buckets, Well.—  
Galvanized—  
Hill's..... \$ doz, 12 qt, \$4.25; 14 qt, \$5.25  
Iron Clad..... \$ doz, 14 qt, \$4.25 @ \$4.50  
Whiting's Flat Iron Band..... \$4.25 @ \$4.50  
Whiting's Wired Top..... \$ doz \$4.00 @ 4.25

Bull Rings—See Rings, Bull.

Butcher's Cleavers—See Cleavers Butchers'.

Butts—  
Brass—  
Wrought Brass..... 75¢75¢10¢  
Cast Brass, Tiebout's..... 83½¢  
Cast Brass, Corbin's, Fast..... 83½¢10¢  
Cast Brass, Loose Joint..... 83½¢10¢

Cast Iron—  
Fast Joint, Narrow..... 50¢10¢5¢ @ 60¢  
Fast Joint, Broad..... 50¢10¢ @ 60¢

Loose Joint, Jap. with Acorns..... 70¢5¢  
Parliament Butts..... 70¢10¢  
Mayer's Hinges..... 70¢10¢  
Loose Pin, Acorns..... 70¢10¢  
Loose Pin, Acorns, Japanned..... 70¢10¢  
Loose Pin, Acorns, Japanned, Plated Tips..... 70¢10¢

Wrought Steel—  
Fast Joint, Narrow..... 50¢10¢5¢ @ 60¢  
Fast Joint, Lt. Narrow..... 50¢10¢ @ 60¢  
Fast Joint, Broad..... 70¢5¢  
Loose Joint, Broad..... 70¢10¢  
Table Butts, Back Flaps, &c..... 70¢10¢  
Inside Blind, Regular..... 70¢10¢  
Loose Pin..... 50¢

Calipers—See Compasses.

Calks, Tee—  
Gautier..... \$ 5¢ @ 6¢  
Dewicks (Burke)..... \$ 5¢ @ 6¢

Can Openers—See Openers, Can.

Cards—  
Horse & Curry..... 10¢10¢10¢10¢10¢  
Cotton..... 10¢10¢10¢  
Wool..... 10¢10¢10¢

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—See Ammunition.

Casters—  
Bed..... \$ Brass..... 55¢55¢19¢  
Plate..... Others..... 60¢60¢10¢  
Shallow Socket..... 40¢10¢  
Deep Socket..... 30¢10¢40¢  
Yale Casters, list May, 1884..... 60¢60¢5¢  
Fale, Gem..... 45¢10¢50¢  
Martin's Patent (Phoenix)..... 60¢60¢10¢  
Payson's Anti-friction..... 30¢  
Giant Truck Casters..... 50¢10¢  
Stationary Truck Casters..... 50¢  
Socket Truck Casters..... 50¢

Cattle Leaders—See Leaders, Cattle.

Chain—  
Trace, 6¼-10-2, exact, \$ pair, \$1.05..... 50¢10¢ @ 50¢10¢5¢  
Trace, 6¼-10-3, exact, \$ pair 92¢..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-2, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-3, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-4, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-5, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-6, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-7, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-8, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-9, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-10, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-11, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-12, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-13, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-14, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-15, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-16, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-17, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-18, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-19, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-20, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-21, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-22, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-23, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-24, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-25, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-26, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-27, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-28, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-29, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-30, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-31, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-32, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-33, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-34, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-35, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-36, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-37, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-38, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-39, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-40, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-41, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-42, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-43, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-44, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-45, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-46, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-47, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-48, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-49, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-50, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-51, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-52, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-53, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-54, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-55, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-56, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-57, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-58, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-59, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-60, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-61, exact, \$ pair \$1.10..... 50¢10¢ @ 50¢10¢5¢  
Trace, 7-10-62,



**Chucks—**

Beach Pat.	each, \$8.00	20%
Morse's Adjustable, each	\$7.00, 20@30	25%
Danbury, each	\$6.00, 30@30	25%
Syracuse, each	\$6.00, 30@30	25%
Skinner's Pat. Drill Chucks	25%	
Skinner's Independent Lathe Chucks	40%	
Skinner's Pat. Comb. Chuck	40%	
Union Mfg. Co.		
Victor	\$8.50, 25%	
Combination	40%	
Universal	40%	
Independent	40%	

**amps—**

B. I. Tool Co.'s Wrought Iron	25%	
Adjustable, Cincinnati	15@10%	
Adjustable, Hammers	15%	
Adjustable, Stearns	20@10%	
Stearns' Adjustable Cabinet and Cor-	20@10%	
ner		
Cabinet, Sargent's	60@40%	
Carriage Makers', Sargent's	70@40%	
Carriage Makers', P. S. & W. Co.	40@40%	
Eberhard Mfg. Co.	40@40%	
Warner's	40@40%	
saw Clamps, etc. Vices, Saw Filers		
Carpenters', Cincinnati	15%	

**Cleavers.**

Butchers'		
Bradley's	25@30%	
L. & J. White	20@25%	
Beatty's	40@40%	
New Haven Edge Tool Co.'s	40%	
P. S. & W. Co.	39@40%	
Forster Bros.	30%	
Schulte, Lohoff & Co.	40@40%	

**Clips—**

Norway, A. & L. 5-16	55@55%	
2nd grade Norway Axle, 14 & 5-16	65@55%	
superior Axle Clips	60@55%	
Norway Spring Bar Clips, 5-16	60@55%	
Wrought-Iron Felice Clips	50%	
steel Felice Clips	50%	
Raker Axle Clips	50%	

**Cloth and Netting. Wire—See Wire, &c.****Cockeyes.****Cocks, Brass.****Hardware list.****Coffee Mills—See Mills, Coffee.****Collars, Dog, &c.**

Medford Fancy Goods Co.	40@10%	
Embossed, Gift, Pope & Steven's list	30@10%	
Leather, Pope & Steven's list	40%	
Brass, Pope & Steven's list	40%	

**Combs, Curry.**

Fitch's	50@10@50@10@10%	
Rubber, per doz \$10.00	20%	
Perfect	50%	

**Compasses, Dividers, &c.—**

Compasses, Callipers, Dividers, 70@70@10%		
Bemis & Call Co.'s	60@5%	
Dividers	60@5%	
Compasses & Callipers	60@5%	
Wing and Inside or Outside	60@5%	
Double	60%	
(Call's Pat. Inside)	30%	
Excelsior	50%	
J. Stevens & Co.'s	25@10%	
Starrett's		
Spring Callipers and Dividers	25@10@10%	
Lock Callipers and Dividers	25@10%	
Combination Dividers	25@10%	

**Coopers' Tools—See Tools, Coopers'.****Cord, Sash—**

Common	\$ 10@11%	
Patent, good quality	\$ 13@13%	
White Cotton Braided, fair	\$ 25@25%	
Common Russia Sash	\$ 13%	
Patent	\$ 22@23%	
Cable Laid Italian Sash	\$ 22@23%	
Indian Cable Laid	\$ 13%	
Silver Lake		
A Quality, White, 50%	10@10@5%	
B Quality, White, 50%	10@10@5%	
C Quality, White, 50%	10@10@5%	
B Quality, Drab, 50%	10@10@5%	
C Quality, White (only)	30@28%	
Sylvan Spring, Extra Braided, White, 34	30%	
Sylvan Spring, Extra Braided, Drab, 30	30%	
Semper Idem, Braided, White, 30	30%	
Egyptian, India Hemp, Braided	25%	
Samson		
Braided, White Cotton, 50%	30@30@5%	
Braided, Drab Cotton, 50%	30@30@5%	
Braided, Italian Hemp, 50%	30@30@5%	
Braided, Linen, 80%	30@30@5%	

**Corkscrews—See Screws, Cork.****Corn Knives and Cutters—See Knives, Corn.****Crackers, Nut—**

Table (H. & B. Mfg. Co.)	40%	
Blake's Pattern	\$ doz \$2.00, 10%	
Turner & Seymour Mfg. Co.	50%	

**Cradles—****Cravens.**

White Cravens, \$ gr. 12@12%	10%	
D. M. Stewart Mfg. Co., Metal Work-		
ers, \$ gr. \$2.50	25%	
D. M. Stewart Mfg. Co., Rolling Mill,		
\$ gr. \$2.50	25%	
See also Chalk.		

**Crow Bars—See Bars, Crow.****Curry Combs—See Combs, Curry.****Curtain Pins—See Pins, Curtain.****Cutters—**

Meat.		
Dixon's \$ dos	40@5%	
Nos.	1 2 3 4	
	\$14.00 \$17.00 \$19.00 \$20.00	

**Woodruff's \$ dos**

Nos.	100 150	
	\$15.00 \$18.00	

**Hales Pattern \$ dos**

Nos.	11 12 13	
	\$27.00 \$33.00 \$45.00	

**American.**

Nos.	1 2 3 4 5	
Each	\$5 \$7 \$10 \$25 \$50 \$60	

**Enterprise.**

Nos.	10 12 22 32 42	
Each	\$3 \$2.50 \$4 \$6 \$10	

**Pennsylvania.**

Nos.	1 2 3 4	
\$ doz	\$24.00 \$28.00 \$36.00 \$28.00	

**Miles' Challenge \$ dos**

Nos.	1 2 3	
	\$22.00 \$30.00 \$40.00	

**Home No. 1.**

\$ doz	\$28.00, 55@10%	
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**Draw Cut, each:**

Nos.	5 6 7 8	
	\$50 \$75 \$100 \$225	

**Beef Shavers (Enterprise).**

	20@10@30%	
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**Chadborn's Smoked Beef Cutter, \$ dos**

	\$95.00	
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**Tobacco.**

Champion	20@10@30%	
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**Wood Bottom.**

\$ doz	\$5.00@5.25	
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**All Iron.**

\$ doz	\$4.25	
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**Nashua Lock Co.'s \$ dos**

	\$18.00 50@55%	
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**Wilson's.**

\$ doz	\$24. 55%	
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**Sargent's \$ dos**

	\$24. 55@10%	
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**Acme**

\$ doz	\$20.00, 40%	
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**Washer.**

Smith's Pat.	\$ doz \$12.00, 20@10@10%	
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**Johnson's.**

\$ doz	\$11.00, 33@%	
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**Peapack's \$ dos Pol.**

	\$14; Jap'd, \$16.00, 55%	
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**Appleton's \$ dos**

	\$10.00, 60@10%	
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**Bonney's**

\$ doz	\$30.00	
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**Cincinnati.**

	25@10%	
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**Cutlery—**

Beaver Falls & Booth's	33%	
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**Wostenholme.**

	\$7.75 to \$	
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**Dampers, &c—**

Dampers, Buffalo	40@10%	
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**Buffalo Damper Clips.**

	40@10%	
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**Excelsior.**

	40@10%	
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**Diggers, Post Hole, &c —**

Samson Post Hole Digger, \$ doz	\$36.00,	
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**Fletcher Post Hole Augers, \$ doz**

	\$30, 20%	
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**Eureka Diggers.**

\$ doz	\$16.00@17.00	
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**Lead's**

\$ doz	\$8.00@9.00	
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**Vaughan's Post Hole Auger, \$ doz**

	\$18.00@14.00	
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**Kohler's Little Giant.**

\$ doz	\$18.00	
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**Kohler's Hercules.**

\$ doz	\$5.00	
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**Kohler's New Champion.**

\$ doz	\$8.00	
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**Schneider.**

\$ doz	\$18.00	
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**Ryan's Post Hole Diggers.**

\$ doz	\$24.00	
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**Cronk's Post Bars, \$ doz**

	\$60.00	
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**Gibbs Post Hole Digger, \$ doz**

	\$30.00, 50%	
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**Imperial, \$ doz**

	\$18. 45%	
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**Dividers—****See Compasses.****Dog Collars—See Collars, Dog, &c.****Door Springs—See Springs, Door.****Drawers.**

Money, \$ doz	\$18@20	
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**Drawing Knives—See Knives, Drawing.****Drills and Drill Stocks—**

Blacksmith's	each \$1.75	
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**Blacksmith's Self-Feeding, each**

	\$7.50, 20%	
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**Breast, P. S. & W.**

	40@10%	
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**Breast, Wilson's.**

	30@5%	
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**Breast, Millers Falls.**

	each \$3.00, 25%	
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**Breast, Bartholomew's.**

	each \$2.50,	
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**Ratchet, Merrill's.**

	20@20@5%	
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**Ratchet, Ingersoll's.**

	25%	
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**Ratchet, Parker's.**

	20@20@5%	
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**Ratchet, Whitney's.**

	20@10%	
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**Ratchet, Weston's.**

	20@25%	
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**Ratchet, Moore's Triple Action.**

	25@30%	
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**Ratchet, Curtis & Curtis.**

	30%	
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**Whitney's Hand Drill, Plain.**

	\$11.00,	
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**Adjustable, \$12.00.**

	20@10%	
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**Wilson's Drill Stocks.**

	10%	
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**Automatic Boring Tools.**

	\$1.75@1.85	
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**Twist Drills—**

Morse	50@10@5%	
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**Standard**

	50@10%	
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**Syracuse (Metal list).**

	50@10%	
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**Cleveland.**

	50@10@5%	
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**Williams**

	50@10@10%	
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**New Process.**

	50@10@5%	
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**4-11 Bits.—See Augers and Bits.****Drill Chucks.—See Chucks.****Dripping Pans—See Pans, Dripping.****Drivers, Screw.**

Douglas Mfg. Co.	20@10@10%	
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**Diston's**

	40@10%	
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**Diston's Pat. Excelsior.**

	45@10%	
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**Buck Bros.**

	30%	
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Roggin's Latches..... \$ doz 30¢@35¢  
 Bronze Iron Drop Latches..... \$ doz 70¢ net  
 Jap'd Store Door Handles—Nuts, \$1.32;  
 Plate, \$1.10; no Plate, \$0.88 ..... net  
 Barn Door, \$ doz \$1.40 ..... 10¢10¢  
 Chest and Lifting..... 70¢  
**Wood—**  
 Saw and Plane..... 40¢10¢@40¢10¢5¢  
 Hammer, Hatchet, Axe, Sledge, &c..... 40¢  
 Brad A.W.I..... \$ gr 25¢  
 Hickory Firmer Chisel, ass'd, \$ gr 4.50  
 Hickory Firmer Chisel, large, \$ gr 5.00  
 Apple Firmer Chisel, ass'd, \$ gr 5.00  
 Apple Firmer Chisel, large, \$ gr 6.00  
 Socket Firmer Chisel, ass'd, \$ gr 3.00  
 Socket Framing Chisel, ass'd, \$ gr 5.00  
 J. S. Smith & Co.'s Pat File..... 50¢  
 File, assorted..... \$ gr 7 1/2 ..... 40¢  
 Auger, assorted..... \$ gr 5.00 ..... 40¢  
 Auger, large..... \$ gr 7.00 ..... 40¢10¢  
 Pat. Auger, lvs..... 30¢10¢  
 Pat. Auger, Douglass..... \$ set \$1.25  
 Pat. Auger, Swan's..... \$ set \$1.00  
 Hoe, Rake, Shovel, &c..... 5¢10¢

### Hangers—

Barn Door, old patterns..... 00¢10¢10¢70¢  
 Barn Door, New England..... 00¢10¢10¢70¢  
 Samson Steel Anti-Friction..... 50¢  
 Orleans Steel..... 50¢  
 Hamilton Wrought Wood Track..... 50¢  
 U. S. Wood Track..... 50¢  
 Champion..... 00¢10¢  
 Rider and Wooster, Medina Mfg. Co.'s  
 list..... 70¢  
 Climax Anti-Friction..... 60¢  
 Climax Anti-Friction for Wood Tracks..... 50¢  
 Zenith for Wood Track..... 50¢  
 Reed's Steel Arm..... 50¢  
 Challenge, Barn Door..... 50¢  
 Sterling's Imp'vd (Anti-Friction)..... 00¢10¢  
 Victor, No. 1, \$15.00; No. 2, \$10.00; No. 3,  
 \$18.00..... 50¢25¢  
 Cheritree..... 50¢10¢  
 Kidder's..... 50¢10¢@60¢  
 The Boss..... 00¢10¢  
 Best Anti-Friction..... 00¢10¢  
 Duplex (Wood Track)..... 00¢10¢5¢  
 Terry's Pat., \$ doz pr. 4 in., \$10.00; 5 in.,  
 \$12.00..... 50¢10¢  
 Terry's Steel Anti-Friction Leader..... 50¢10¢  
 Terry's Steel Anti-Friction Ideal..... 50¢10¢  
 Cronak's Patent, Steel Covered..... 50¢5¢  
 Wood Track Iron Clad, \$ ft. 10¢ ..... 45¢@60¢  
 Carrier Steel Anti-Friction..... 50¢5¢5¢  
 Architect, \$ set \$6.00..... 20¢  
 Eclipse..... 20¢10¢  
 Felix, \$ set \$4.50..... 20¢  
 Richards..... 30¢@50¢10¢  
 Lane's Steel Anti-Friction..... 50¢  
 Ball Bearing Door Hanger..... 20¢10¢@25¢10¢  
 Warner's Pat..... 20¢@20¢10¢  
 Stearns' Anti-Friction..... 20¢@20¢10¢  
 Stearns' Challenge..... 25¢10¢@25¢10¢10¢  
 Faultless..... 40¢@40¢5¢  
 American..... 20¢10¢  
 Rider & Wooster, No. 1, 02¢; No. 2,  
 75¢..... 40¢  
 Paragon, Nos. 1, 2 and 3..... 40¢10¢  
 Cincinnati..... 25¢10¢  
 Paragon, Nos. 5, 5 1/2, 7 and 8..... 20¢10¢  
 Crescent..... 00¢@50¢10¢  
 Nickel Cast Iron..... 50¢  
 Nickel, Malleable Iron and Steel..... 40¢  
 Scranton Anti-Friction Single Strap..... 33¢  
 West, 4 in. Wheel, \$15.00; 5 in.,  
 \$21.00..... 45¢  
 Star..... 40¢@40¢10¢5¢  
 May..... 50¢5¢@50¢10¢  
 Barry, \$6.00..... 40¢10¢

### Harness Snaps—See Snaps.

### Hatchets—

List Jan. 1, 1886..... 35¢@40¢  
 Isaiah Blood..... 35¢@40¢  
 Hunt's Shingling, Lath and Claw..... 40¢5¢  
 Hunt's Hammer Co..... 40¢  
 Buffalo Hammer Co..... 40¢10¢5¢  
 Hurd's..... 40¢10¢5¢  
 Fayette B. Plumb..... 40¢10¢5¢  
 Wm. Mann, Jr., & Co..... 50¢5¢5¢  
 Underhill Edge Tool Co..... 40¢5¢@40¢10¢  
 Underhill's, Haines and Bright..... 39¢5¢  
 C. Hammond & Son..... 40¢10¢5¢  
 Simmons..... 40¢10¢5¢  
 Peck's..... 40¢10¢@40¢10¢5¢  
 Kelly's..... 50¢5¢5¢  
 Sargent & Co..... 50¢  
 P. S. & W. Co..... 50¢  
 Ten Eyck Edge Tool Co..... 40¢10¢@40¢10¢5¢  
 Collins..... 10¢  
 Schulte, Lohoff & Co..... 50¢35¢5¢

### Hay and Straw Knives—See Knives.

### Hinges—

**Blind Hinges—**  
 Parker..... 75¢2¢  
 Palmer..... 60¢5¢10¢  
 Seymour..... 70¢2¢  
 Nicholson..... 45¢10¢  
 Huffer..... 50¢  
 Clark's, Nos. 1, 3, 5, 40 and 50..... 75¢10¢5¢@90¢  
 Clark's Mortise Gravity..... 60¢  
 Sargent's, Nos. 1, 3, 5, 11, 13..... 75¢10¢@55¢10¢5¢  
 Sargent's, No. 12..... 77¢10¢10¢  
 Reading's Gravity..... 75¢10¢@75¢10¢5¢  
 Sheard's..... 75¢10¢  
 Noiseless..... 80¢  
 Buffalo..... 80¢  
 Clark's Genuine Pattern..... 80¢  
 C. S. Lull & Porter..... 75¢10¢  
 Acme, Lull & Porter..... 75¢  
 Queen City Reversible..... 70¢10¢5¢@75¢  
 Clark's Lull & Porter, Nos. 0, 1, 1 1/2,  
 2, 2 1/2, 3..... 75¢10¢2¢  
 North's Automatic Blind Fixtures, No.  
 2, for Wood, \$10.50; No. 3, for Brick,  
 \$13.50..... 25¢2¢  
**Gate Hinges—**  
 Western..... \$ doz \$4.40, 60¢  
 N. E. Reversible..... \$ doz \$7.00, 55¢  
 N. E. Reversible..... \$ doz \$5.20, 50¢10¢  
 Clark's, Nos. 1, 2, 3..... 60¢10¢5¢  
 N. Y. State..... \$ doz \$12.50, 50¢  
 Automatic..... \$ doz pair \$4.50, 50¢  
 Common Sense..... \$ doz pair \$4.50, 50¢  
 Seymour's..... 45¢10¢  
 Shepard's..... 00¢10¢5¢  
 Reed's Latch and Hinges..... \$ doz \$12.00, 50¢  
**Spring Hinges—**  
 Jap's Spring and Blank Butts..... 40¢  
 Union Spring Hinge Co.'s list, March,  
 1889..... 20¢

Acme..... 30¢  
 J. S..... 25¢10¢  
 Empire and Crown..... 20¢  
 Hero and Monarch..... 55¢  
 American, Gem, and Star..... 20¢  
 Oxford..... 20¢10¢  
 Barker's Double Acting..... 20¢10¢  
 Union Mfg. Co..... 25¢  
 Sommer's..... 30¢  
 Buckman's..... 15¢@20¢  
 Chicago..... 30¢  
 Wiles..... 10¢  
 Devore's..... 40¢  
 Rex..... 40¢  
 Royal..... 00¢  
 Reliable..... 00¢  
 Champion..... 00¢  
**Wrought Iron Hinges**  
 Strap and T..... 70¢10¢  
 Screw Hook and Strap..... 6 to 12 in., \$ 4 1/2-10¢  
 14 to 20 in., \$ 3 1/2-7-10¢  
 22 to 36 in., \$ 3-2-10¢  
 Heavy Welded..... 6 to 12 in., \$ 4 1/2-10¢  
 14 to 20 in., \$ 3 1/2-7-10¢  
 22 to 36 in., \$ 3-2-10¢  
 Screw Hook..... 1/4 in., \$ doz \$1.50  
 and Eye..... 1/4 in., \$ doz \$2.45 10¢  
 3/4 in., \$ doz \$3.80  
 Rolled Blind Hinges, Nos. 39 and 34..... 50¢10¢  
 Rolled Blind Hinges, Nos. 239 and 234..... 55¢10¢  
 Rolled Plate..... 70¢10¢  
 Rolled Raised..... 70¢10¢  
 Plate Hinges, 8, 10 and 12 in., \$ 5-4¢  
 "Providence" over 12 in., \$ 5-4¢  
**Hoes—**  
 D. & H. Scovill..... 20¢  
 Lane's Crescent Planters Pattern..... 45¢5¢  
 Lane's Razor Blade, Scovill Pattern..... 30¢  
 Maynard, S. & O. Pat..... 45¢5¢  
 Sandusky Tool Co., S. & O. Pat..... 00¢10¢  
 Hubbard & Co., S. & O. Pat..... 00¢10¢  
 Chattanooga Tool Co., S. & O. Pat..... 50¢10¢10¢  
 Grub..... 00¢60¢10¢  
**Handled—**  
 Garden, Mortar, &c..... 70¢  
 Planter's, Cotton, &c..... 70¢  
 Warren Hoe..... 60¢  
 Magic..... \$ doz \$4.00

**Hog Rings and Rings—See Rings and Ringers.**  
**Holisting Apparatus—See Machines, Holisting.**  
**Hollow-Ware—See Ware, Hollow.**  
**Holders.**  
 Bag.  
 Sprengle's Pat..... \$ doz \$18..... 60¢  
 Bit.  
 Extension.  
 Barber's, \$ doz \$15.00..... 40¢@40¢10¢  
 Treas., \$ doz \$20.00..... 40¢@40¢10¢  
 Diagonal..... \$ doz \$24.00, 40¢  
 Angular..... \$ doz \$24.00, 40¢5¢  
**File and Tool—**  
 Bals Pat..... \$ doz \$4.00, 25¢  
 Nicholson File Holders..... 20¢  
**Hooks—**  
 Cast Iron—  
 Bird Cage, Sargent's list..... 60¢10¢10¢  
 Bird Cage, Reading..... 60¢10¢10¢  
 Clothes Line, Sargent's list..... 60¢10¢10¢10¢  
 Clothes Line, Reading list..... 60¢10¢10¢10¢  
 Ceiling, Sargent's list..... 55¢10¢10¢  
 Harness, Reading list..... 55¢10¢10¢10¢  
 Coat and Hat, Sargent's list..... 55¢10¢10¢10¢  
 Coat and Hat, Reading..... 50¢10¢@50¢10¢10¢  
**Wrought Iron—**  
 Cotton..... \$ doz \$1.25  
 Cotton Pat. (N. Y. Mallet & Handle Wks.)..... 30¢  
 Tassel and Picture (T. & S. Mfg. Co.)..... 50¢  
 Wrought Staples, Hooks, &c..... See Wrought Goods.  
**Wire—**  
 Wire Coat and Hat, Gem, list April,  
 1886..... 50¢  
 Wire Coat and Hat, Miles', list April,  
 1886..... 50¢  
 Indestructible Coat and Hat..... 45¢  
 Wire Coat and Hat, Standard..... 45¢  
 Handy Hat and Coat..... 50¢10¢  
 Steady Ceiling Hooks..... 50¢10¢  
 Belt..... 80¢@80¢10¢  
**Miscellaneous.**  
 Grass, No. 2, \$2.00; No. 3, \$2.25; No. 4, \$2.50  
 Nolin's Grass..... \$ doz \$2.25  
 Bush..... 55¢@60¢  
 Whimtree—Patent..... 55¢  
 Hooks and Eyes—Malleable Iron..... 70¢@70¢10¢  
 Fish Hooks, American..... 60¢10¢10¢  
 Bench Hooks..... See Bench Stops.

**Horse Nails—See Nails, Horse.**  
**Horse Shoes—See Shoes, Horse.**  
**Hose, Rubber—**  
 Competition..... 75¢10¢@75¢10¢5¢  
 Standard..... 70¢@70¢10¢  
 Extra..... 00¢@60¢10¢  
 N. Y. B. & P. Co., Para..... 20¢10¢  
 N. Y. B. & P. Co., Extra..... 50¢  
 N. Y. B. & P. Co., Dundee..... 60¢10¢5¢  
**Huskies—**  
 Blair's Adjustable..... \$ gr 88.00  
 Blair's Adjustable Clipper..... \$ gr 7.00  
 Hubbard's Solid Steel..... \$ gr 4.50  
**Indurated Fiber-Ware—See Ware, Indurated Fiber.**  
**Irons.**  
 Sad—  
 From 4 to 10, at factory..... \$ 100 @  
 \$2,000 @ \$2.75  
 Self-Heating, Tailors'..... \$ doz \$18.00 net  
 Gleason's Shield and Toilet..... 25¢  
 Mrs. Pott's Irons..... 40¢@40¢10¢  
 Enterprise Star Irons..... 40¢

Combined Fluter and Sad Iron, \$ doz,  
 \$15.00..... 15¢  
 Fox Reversible, Self-Fluter \$ doz \$24.00  
 Chinese Laundry (N. E. Butt Co.) \$ doz, 15¢  
 New England..... 15¢  
 Mahony's Troy Fol. Irons..... 25¢  
 Sensible..... 20¢@20¢5¢  
 National Self-Heating..... 30¢  
**Soldering—**  
 Soldering Coppers..... \$ 22 @ 23¢  
 Covert's Adjustable, list Jan. 1, 1886..... 25¢5¢  
**Irons, Pinking, per doz., 65¢.**  
**Jack Screws—See Screws.**  
**Jacks, Wagon.**  
 Delay..... 25¢  
**Kettles—**  
 Brass, 7 to 17 in., \$ 24¢ 21¢  
 Spun, Stamped.  
 Brass larger than 17 in., 20¢ 23¢  
 Enameled and Tea—See Hollow-Ware.

**Keys—**  
 Lock Ass'n list Dec. 30, 1886..... 50¢10¢  
 Eagle, Cabinet, &c..... 33¢@55¢  
 Hotchkiss' Brass Blanks..... 40¢  
 Hotchkiss, Copper and Tinned..... 40¢  
 Hotchkiss' Pad, and Cab..... 35¢  
 Hatchet Red Keys..... \$ doz \$4.00, 15¢  
 Wollensak Tinned..... 60¢10¢  
**Knife Sharpeners—See Sharpeners, Knife.**  
**Knives.**  
 Butcher, Shoe, &c—  
 Wilson's Butcher Knives..... 35¢@30¢  
 Ames' Butcher Knives..... 25¢  
 Foster Bros', Butcher, &c..... 40¢  
 Nichols' Butcher Knives..... 40¢10¢  
 Ames' Shoe Knives..... 20¢25¢  
 Ames' Bread Knives, \$ doz \$1.50, 15¢@20¢  
 Moran's Shoe and Bread..... 20¢  
 Hay and Straw..... See Hay Knives.  
 Table and Pocket..... See Cutlery.  
 Corn, Auburn Mfg. Co. Western Pat..... \$2.00  
 Corn, Auburn Mfg. Co. Crescent..... \$3.50  
**Corn—**  
 Bradley's..... 10¢  
 Wadsworth's..... 25¢  
**Drawing—**  
 W. & W. B..... 75¢@75¢10¢  
 Mix..... 75¢@75¢10¢  
 New Haven..... 00¢10¢@00¢10¢5¢  
 Merrill..... 00¢10¢@00¢10¢5¢  
 Douglas..... 75¢@75¢5¢  
 Wadsworth..... 15¢@15¢5¢  
 L. & J. White..... 20¢5¢  
 Bradley's..... 35¢  
 Adjustable Handle..... 25¢@33¢4¢  
 Wilkinson's Folding..... 25¢@25¢5¢  
**Hay and Straw—**  
 Lightning, Mfrs' price \$ doz \$18.00, 25¢  
 But jobbers cut this price freely,  
 often selling at \$8 @ \$8.50.  
 Wadsworth's..... 40¢7¢@40¢10¢  
 Carter's Needle..... \$ doz \$11.50@12.00  
 Heath's..... \$ doz \$13.50@14.00  
 Auburn Hay, Com. and Spear Point..... 50¢  
 Auburn, Straw..... 40¢  
 Nolin's Hay..... \$ doz \$10.00  
**Mining.**  
 Am. (2d quality), \$ gr. 1 blade  
 blades, \$12; 3 blades, \$18..... net  
 Lothrop's..... 20¢10¢  
 Smith's, \$ doz, Single, \$2.00; Double, \$3  
 \$4..... 40¢45¢  
 Knapp & Cowles..... 50¢10¢@60¢  
 Buffalo Adjustable..... \$ doz \$3.00 25¢  
 Buffalo Double Adj' table, \$ doz \$3.00 25¢

**Knobs—**  
 Door Mineral..... 60¢@65¢  
 Door Por. Jap'd..... 70¢75¢  
 Door Por. Nickel..... \$2.00@2.25  
 Door Por. Plated, Nickel..... \$2.00@2.25  
 Drawer, Porcelain..... 60¢10¢@60¢10¢10¢  
 Hemacite Door Knobs..... 40¢10¢5¢  
 Yale & Towne Wood, list Dec., 1885..... 40¢  
 Furniture Plain..... 75¢ gro inch, 10¢  
 Furniture, Wood Screws..... 25¢10¢  
 Base, Rubber Tip..... 70¢10¢5¢  
 Picture, Judd's..... 60¢10¢10¢@70¢  
 Picture, Sargent's..... 70¢10¢  
 Picture, Hemacite..... 35¢5¢  
 Shutter, Porcelain..... 65¢10¢  
 Carriage, Jap..... \$ gro 80¢, 60¢10¢  
**Ladies—**  
 Melting, Sargent's..... 55¢10¢  
 Melting, Reading..... 35¢10¢  
 Melting, Monroe's Pat..... \$ doz \$4.00, 40¢  
 Melting, P. S. & W..... 35¢10¢@40¢  
 Melting, Warner's..... 50¢

**Lanterns—**  
 Tubular—  
 Plain with Guards, \$ doz..... \$4.00@4.25  
 Lift Wire, with Guards..... \$4.50@4.75  
 Square Plain, with Guards..... \$4.00@4.25  
 Sq. Lift Wire, with Guards..... \$4.25@4.50  
 Without Guards, 25¢ \$ doz less.  
 Police, Small..... \$6.00; Medium, \$7.25;  
 Large, \$9.75..... 20¢@20¢25¢  
**Lawn Mowers—See Mowers, Lawn.**  
**Leaders, Cattle.**  
 Humason, Beckley & Co.'s..... 70¢  
 Sargent's..... 60¢@70¢  
 Hotchkiss..... 30¢  
 Peck, Stow & W. Co..... 00¢10¢  
**Lemon Squeezers—See Squeezers, Lemon.**  
**Lifters, Transom.**  
 Wollensak's:  
 Class 3 and 4, Bronzed Iron..... 50¢  
 Class 3 and 4, Bronze Metal..... 25¢  
 Class 3 and 4, Brass..... 35¢  
 Skylight Lifters..... 35¢  
 Crown, Eagle and Shield..... 50¢  
 Reiter's, list Aug. 1, 1889..... 50¢10¢10¢2¢  
 Bronzed Iron Rods..... 50¢10¢10¢2¢  
 Brass, Real Bronze or Nickel Plate, 30¢

Excelsior..... 50¢10¢2¢  
 Shaw's..... 50¢10¢  
 Payson's Universal..... 40¢@40¢10¢

### Lines—

Cotton and Linen Fish, Draper's..... 50¢  
 Draper's Chalk..... 60¢  
 Draper's Mason's Linen, 84 ft. No. 1,  
 \$1.25; No. 2, \$1.75; No. 3, \$2.25; No. 4,  
 \$2.75; No. 5, \$3.25..... 25¢  
 Cotton Chalk..... 50¢  
 Samson, Cotton, No. 4, \$2; No. 4 1/2, \$2.50;  
 15¢  
 Silver Lake, Braided, No. 0, \$6.00; No.  
 1, \$6.50; No. 2, \$7.00; No. 3, \$7.50 \$ gr.  
 Mason's Linen, No. 3 1/2, \$1.50; No. 4,  
 \$2.00; No. 4 1/2, \$2.50..... 45¢  
 Mason's Colored Cotton..... 45¢  
 Wire Clothes..... Nos. 17 70 30  
 100 ft..... \$4 00 \$3 50 \$3 00  
 Ventilator Cord, Samson Braided,  
 White or Drab Cotton..... \$ doz \$7.50, 20¢

### Locks, &c.—

**Cabinet—**  
 Eagle, Gaylord Par- list March, '84, rev  
 ker and Corbin..... Jan. 1, '85, 39¢42¢  
 Delta, Nos. 36 to 39..... 40¢  
 Delta, Nos. 51 to 63..... 40¢10¢  
 Delta, Nos. 86 to 90..... 30¢  
 Stoddard Lock Co..... 00¢33¢4¢  
 "Champion" Night Latches..... 40¢  
 Barnes Mfg. Co..... 40¢@40¢10¢  
 Eagle and Corbin Trunk..... 25¢2¢  
 "Champion" Cab. and Corbin..... 39¢4¢  
 Yale..... net prices  
 Roman's..... 25¢  
**Door Locks, Latches, &c.**  
 R. & E. Mfg. Co., list Mar. 30, 1889..... 00¢10¢@60¢  
 1889..... \$10¢10¢  
 Mallory, Wheeler & Co., list  
 July, '88..... lower net  
 Sargent & Co., list Aug. 1, '88  
 Reading Hardware Co., list  
 Feb. 2, '88..... prices  
 Brittan, Graham & Mathes, list Jan.  
 1890..... often  
 Perkins' Burglar Proof..... made.  
 Plate..... 00¢10¢10¢  
 F. Manly's "Extension Cylinder" \$10.50  
 \$ doz.  
 Barnes Mfg. Co..... 40¢@40¢10¢  
 Yale..... net prices  
 Delta Flat Key..... 30¢  
 L. & C. Round Key Latches..... 50¢10¢  
 L. & C. Flat Key Latches..... 33¢10¢  
 Roman's Night Latches..... 15¢  
 Shephardson or U. S..... 35¢  
 Felter or American..... 40¢10¢  
 Seed's N. Y. Haap Lock..... 25¢  
**Padlocks—**  
 List Dec. 23, '84..... 75¢@75¢10¢  
 Brittan, Graham & Mathes..... 75¢10¢  
 Yale Lock Mfg. Co.'s..... net prices  
 Eagle..... 25¢2¢  
 Eureka, Eagle Lock Co..... 40¢2¢  
 Roman's, Nos. 0 to 9..... 30¢  
 Roman's Scandinavian, &c., Nos. 100 to  
 505..... 50¢, 15¢  
 A. E. Delta..... 40¢  
 Champion Padlocks..... 40¢  
 Hotchkiss..... 30¢  
 Horseshoe..... 45¢  
 Barnes Mfg. Co..... 40¢@40¢10¢  
 Brock's..... 30¢  
 Nolin's Pat..... 25¢  
 Scandinavian..... 00¢@00¢10¢  
 E. T. Frain's Keystone Scandinavian  
 Nos. 119, 120, 130 and 140..... 50¢10¢  
 Other Nos..... 65¢  
 Ames Sword Co. up to No. 150..... 40¢  
 Ames Sword Co. above No. 150..... 50¢  
**Sash, &c.**  
 Clark's, No. 1, \$10; No. 2, \$8 \$ gr..... 33¢4¢  
 Ferguson's..... 33¢4¢  
 Morris and Triumph, list Aug. 16, 1886..... 60¢2¢  
 Victor..... 60¢10¢2¢  
 Walker's..... 10¢  
 Attwell Mfg. Co..... 25¢33¢4¢  
 Reading..... 60¢10¢@60¢10¢10¢  
 Hammond's Window Springs..... 40¢  
 Common Sense, Jap'd, Cop'd and  
 Br'd..... \$ gr \$4.00  
 Common Sense, Nickel Plated..... \$ gr \$10.00  
 Universal..... 30¢  
 Kempshall's Gravity..... 60¢  
 Kempshall's Model..... 60¢@60¢10¢  
 Corbin's Daisy, list Feb. 15, 1886..... 70¢  
 Payson's Perfect..... 60¢@60¢10¢  
 Hugunin's Sash Balance..... 25¢5¢2¢  
 Hugunin's New Sash Locks..... 25¢5¢2¢  
 Stoddard "Practical"..... 10¢  
 Ives' Patent..... 60¢@60¢10¢  
 Linsche's, Nos. 100 and 110, \$ gr 8¢,  
 10¢, \$10.00..... 20¢10¢  
 Davis, Bronze, Barnes Mfg. Co..... 50¢  
 Champion Safety, list March 1, 1888  
 Security..... 55¢5¢5¢  
 Buckeye..... \$ gro \$4.80

**Lumber Tools—See Tools, Lumber.**  
**Lustre—**  
 Four-ounce Bottles..... \$ doz, \$1.75; \$  
 gross..... \$17.00  
**Machines.**  
**Boring—**  
 Without  
 Augers, Upright, Angular.  
 Douglas..... \$5.50 \$6.75..... 50¢  
 Sash's Rice's Pat. 5.50 6.75..... 40¢10¢10¢  
 Jennings..... 5.50 6.75..... 45¢@45¢10¢  
 Other Machines..... 2.35 2.75..... net  
 Phillips' Patent  
 with Augers..... 7 00 7 50.....  
**Fluting.**  
 Knox, 4 1/2-inch Rolls..... \$3.25 each 55¢  
 Knox, 6-inch Rolls..... \$3.60 each 55¢  
 Eagle, 3 1/2-inch Roll, \$2.15..... 35¢  
 Eagle, 5 1/2-inch Roll, \$2.85..... 35¢  
 Crown 1 1/2 in., \$3.50; 6 in., \$4.00; 8 in.,  
 \$5.50 each..... 25¢  
 Crown Jewel, 6 in..... \$5.50 each, 35¢  
 American, 5 in., \$3.00; 6 in., \$3.40; 7 in.,  
 \$4.50 each..... 35¢  
 Domestic Fluter..... each, \$1.50  
 Geneva Hand Fluter, White Metal..... \$ doz \$12, 25¢  
 Crown Hand Fluter, No. 1, \$15.00; No.  
 2, \$12.50; \$3.00..... 30¢  
 Shepard Hand Fluter, No. 85 \$ doz  
 \$15.30..... 40¢





Atkins' Circular Shingle an Heading 50¢105  
 Atkins' Silver Steel Diamond X Cuts 70¢  
 Atkins' Special Steel Dexter X Cuts 50¢  
 Atkins' Special Steel Diamond X Cuts 30¢  
 Atkins' Champion and Electric Tooth X Cuts 24¢25¢  
 Atkins' Hollow Back X Cuts 18¢  
 Atkins' Mulay, Mill and Drag 40¢105  
 Atkins' One-Man Saw, with handles 32¢  
 W. M. & C., Hand 30¢50¢105  
 W. M. & C., Champion X Cuts, Reg. Jar 24¢26¢  
 W. M. & C. X Cuts, Thin Back 27¢29¢  
 Peace Circular and Mill 45¢105  
 Peace Hand Panel and Rip 20¢105  
 Peace Cross Cuts, Standard 20¢105  
 Peace Cross Cuts, Thin Back 27¢28¢  
 Richardson's Circular and Mill 45¢45¢105  
 Richardson's X Cuts, No. 1, 30¢; No. 2, 27¢; No. 3, 24¢  
 Hack Saws—See Saws, Hack.  
 Griffin's, complete 40¢105  
 Griffin's Hack Saw, Blades 40¢105  
 Star Hack Saws and Blades 25¢  
 Diamond Hack Saws and Blades 25¢  
 Eureka and Crescent 25¢  
 Scroll—  
 Lester, complete, \$10.00 25¢  
 Rogers, complete, \$4.00 25¢  
 Barnes' Builders' and Cabinet Makers' 15¢  
 Barnes' Scroll Saw Blades 35¢  
 Saw Frames—See Frames, Saw.  
 Saw Sets—See Sets, Saw.  
 Saw Tools—See Tools, Saw.  
 Sets.  
 Axel and Tool.  
 Alken's Sets, Axle and Tools, No. 20, \$10.00 55¢105  
 Pray's Ad. Tool Hds., Nos. 1, \$12; 2, \$18; 3, \$12; 4, \$8 20¢25¢105  
 Miller's Falls Ad. Tool Hds., Nos. 1, \$12; 2, \$18 25¢  
 Henry's Combination Hart 40¢105  
 Brad Sets, No. 42, \$10.50; No. 43, \$10.50 70¢105  
 Stanley's Excelsior, No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50 30¢105  
 Nail—  
 Square 4¢ gr., \$4.00 \$4.25  
 Round 4¢ gr. \$3.25  
 Buck Bros. 27¢5¢  
 Cannon's Diamond Point 4¢ gr., \$12 20¢  
 Rivet.  
 Regular list 50¢105  
 Stillman's Genuine 40¢50¢  
 Stillman's Imita. 40¢50¢  
 Common Lever 40¢50¢  
 Morrill's No. 1, \$15.00; No. 3, \$24.00 40¢50¢  
 Leach's No. 0, \$8.00; No. 1, \$15.00 40¢50¢  
 Nash's No. 0, \$10.00; No. 1, \$15.00 40¢50¢  
 Hammer, Hotchkiss 55¢50¢  
 Hammer, Bemis & Call Co.'s new Pat. 30¢50¢  
 Bemis & Call Co.'s Lever and Spring Hammer 30¢50¢  
 Bemis & Call Co.'s Plate 10¢  
 Bemis & Call Co.'s Cross Cut 12¢4¢  
 Alken's Genuine 13¢105  
 Alken's Imitation 7¢105  
 Hart's Pat. Lever 20¢  
 Diston's Star, \$0. No. 15, \$6.50; No. 20, \$10.00 105¢  
 Atkin's Lever, \$0 No. 1, \$6.00; No. 2, \$8.00 80¢  
 Atkin's Criterion 75¢  
 Croissant (Keller), No. 1, \$15.00; No. 2, \$24.00 40¢105  
 Avery's Saw Set and Punch 50¢  
 Chieftain H. R. Co.'s Superior 40¢105  
 Scales—  
 Hatch, Counter, No. 171, good quality 21¢  
 Hatch, Tea, No. 161 20¢  
 Union Platform, Plain 20¢22¢  
 Union Platform, Striped 20¢22¢  
 Chatillon's Grocers' Trip Scales 50¢  
 Chatillon's Eureka 25¢  
 Chatillon's Favorite 40¢  
 Family Turnbolls 40¢  
 Richie Bros.' Platform 40¢  
 Scale Beams—See Beams, Scale.  
 Scissors, Fluting 45¢  
 Scrapers—  
 Adjustable Box Scraper (S. R. & L. Co.) \$6.50 30¢105  
 Box, 1 Handle 40¢105  
 Box, 2 Handle 40¢105  
 Defiance Box and Ship 20¢105  
 Foot 50¢105  
 Ship, Common 40¢105  
 Ship, R. I. Tool Co. 105¢  
 Screen Window and Door Frames—See Frames.  
 Screw Drivers—See Drivers, Screw.  
 Screws.  
 Cork—  
 Hammon & Beckley Mfg. Co. 40¢105  
 Williamson's 35¢105  
 Hows Bros & Hulbert 35¢  
 Wood—  
 List March 1, 1889.  
 Flat Head Iron 50¢  
 Round Head Iron 40¢  
 Flat Head Brass 45¢  
 Round Head Brass 35¢  
 Flat Head Bronze 45¢  
 Round Head Bronze 35¢  
 Machine—  
 Flat Head, Iron 55¢  
 Round Head, Iron 50¢

Bench and Hand—  
 Bench, Iron 55¢105  
 Bench, Wood, Beech 20¢105  
 Bench, Wood, Hickory 20¢105  
 Hand, Wood 25¢105  
 Lag, Blunt Point, list Jan. 1, 1890 75¢105  
 Coach and Lag, Gimlet Point, list Jan. 1, 1890 75¢  
 Red Head, Sargent's 60¢105  
 Hand Rail, H. & B. Mfg. Co. 70¢105  
 Hand Rail, Am. Screw Co. 75¢  
 Jack Screws, Millers Falls list 50¢50¢5¢  
 Jack Screws, P. S. & W. 35¢  
 Jack Screws, Sargent's 60¢105  
 Jack Screws, Stearns' 40¢40¢105  
 Scroll Saws—See Saws, Scroll.  
 Scythe Snaths—See Snaths, Scythe.  
 Sharpeners, Knife.  
 Parkins.  
 Applewood Handles 40¢  
 Rosewood or Cocobolo 40¢  
 Shaves, Spoke.  
 Iron 45¢  
 Wood 30¢  
 Bailey's (Stanley R. & L. Co.) 40¢105  
 Stearns 20¢105  
 Cincinnati 25¢105  
 Shears—  
 American (Cast) Iron 75¢105  
 Pruning 75¢105  
 See Pruning Hooks and Shears.  
 Barnard's Lamp Trimmers 40¢  
 Tinner's 20¢25¢  
 Seymour's, list, Dec. 1889 60¢105  
 Heinisch's, list, Dec. 1881 60¢105  
 Heinisch's Tailor's Shears 35¢4¢  
 First quality C. S. Trimmers 80¢105  
 Second quality C. S. Trimmers 80¢105  
 Acme Cast Shears 10¢105  
 Diamond Cast Shears 10¢  
 Victor Cast Shears 75¢105  
 Howe Bros. & Hulbert, Solid Forged Steel 40¢  
 Chicago Drop Forge & P. Co., Solid Steel Forged 60¢  
 Clauss Shear Co., Japanned 70¢  
 Clauss Shear Co., Nickleled, same list 60¢  
 Electric list net  
 Pruning Shears and Hooks.  
 Diston's Combined Pruning Hook and Saw 40¢  
 Diston's Pruning Hook 40¢105  
 E. S. Lee & Co.'s Pruning Tools 40¢  
 Pruning Shears, Henry's Pat. 40¢  
 Henry's Pruning Shears, \$0 45¢ net  
 Wheeler, M. & C. Co.'s Combination 45¢ net  
 Dunlap's Saw and Chisel 40¢50¢  
 J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25  
 P. S. & W. Co. 60¢  
 Tinner's, &c.—  
 Shears and Snips (P. S. & W.) 20¢25¢  
 Punches, see Punches.  
 Snips, J. Mallinson & Co. 33¢4¢  
 Sheaves—  
 Sliding Door—  
 M. W. Co., list July, 1888 50¢105  
 R. & E., list Dec. 18, 1885 50¢105  
 Corbin's list 60¢105  
 Patent Roller 60¢105  
 Patent Roller, Hatfield 75¢  
 Russell's Anti-Friction, list Dec. 18, 1885 60¢25¢  
 Moore's Anti-Friction 50¢  
 Sliding Shutter—  
 R. & E., list Dec. 18, 1885 60¢105  
 Sargent's list 60¢105  
 Reading list 60¢105  
 Ship Tools—  
 L. & J. White 20¢5¢  
 Shoes, Horse, Mule, &c.—  
 Horse—  
 Burden's, Perkins', Phoenix, at factory 40¢  
 Mule—  
 Add \$1 keg to above prices.  
 Ox Wrought—  
 Ton lots 9¢  
 1000 lb lots 9¢  
 500 lb lots 10¢  
 Shot—  
 (Eastern prices 2¢ off, cash, 5 days.)  
 Drop, 25 lb bag 21¢  
 Drop, 5 lb bag 29¢  
 Buck and Chilled, 25 lb bag 14¢  
 Buck and Chilled, 5 lb bag 34¢  
 Shovels and Spades—  
 Ames' Shovels, Spades, &c., list Nov. 1, 1885 20¢  
 NOTE—Jobbers frequently give 5¢7¢ extra on above.  
 Griffith's Black Iron 50¢105  
 Griffith's C. S. 60¢105  
 Griffith's Solid C. S. R. R. Goods 20¢  
 Old Colony (Sanford Fork & Tool Co.) 30¢  
 St. Louis Shovel Co. 20¢20¢75¢  
 Hussey, Binns & Co. 15¢25¢  
 Hubbard & Co. 20¢20¢75¢  
 Lehigh Mfg. Co. 50¢105  
 Payne Pettibone & Son, list January, 1889 30¢  
 Remington's (Lowman's Pat.) 30¢105  
 Rowland's, Black Iron 30¢105  
 Rowland's Steel 60¢50¢105  
 Shovels and Tongs—  
 Iron Head 60¢105  
 Brass Head 60¢105  
 Sieves—  
 Mann's Tin Rim 50¢25¢  
 Buffalo Metallic, S. S. & Co. 50¢25¢  
 Shaker (Barier's Pat.) Flour Sifters 40¢  
 Electric 40¢  
 A. & W. Sifters 40¢

Hunter's 50¢20¢  
 Smith's Adjustable Sifters 40¢20¢  
 Smith's Adjustable Milk Strainer 40¢20¢  
 Smith's Adjustable T. & C. Strainer 40¢20¢  
 Sieves, Wooden Rim—  
 Mesh 18, Nested, 40¢ 80¢  
 Mesh 20, Nested, 40¢ 80¢  
 Mesh 24, Nested, 40¢ 115¢  
 Skelins, Thimble—  
 Western list 75¢5¢75¢105  
 Columbus Wrt. Steel, list Jan. 3, 1889 45¢105  
 Coldbrookdale Iron Co. 50¢105  
 Utica P. S. T. Skelins 60¢  
 Utica Turned and Fitted 35¢  
 Slates—  
 School, by case 50¢50¢105  
 Snaps, Harness, &c.—  
 Anchor (T. & S. Mfg. Co.) 50¢  
 Fitch's (Bristol) 50¢105  
 Hotchkiss 10¢  
 Andrews 50¢  
 Sargent's Patent Guarded 70¢105  
 German, new list 40¢105  
 Cover, New Patent 60¢25¢  
 Cover, New R. E. 60¢105  
 Covered Spring 60¢105  
 Snaths, Scythe.  
 List 50¢5¢20¢60¢105  
 Soldering Irons—See Irons, Soldering.  
 Spittoons, Cuspidors, &c.—  
 Standard Fiberglass—  
 Cuspidors, 8 1/2-inch, 40¢, No. 5, 85¢; No. 5X 80¢  
 Spittoons, Daisy, 8-inch, No. 1, 44¢; 10 and 11 inch, 40¢.  
 Spoke Shaves—See Shaves, Spoke.  
 Spoke Trimmers—See Trimmers, Spoke.  
 Spoons and Forks—  
 Tinned Iron—  
 Basting, Cen. Stamp, Co.'s list 70¢105  
 Solid Table and Tea, Cen. Stamp Co.'s list 70¢105  
 Buffalo S. S. & Co. 35¢4¢  
 Silver-Plated (4 mos. or 5¢ cash 30 days)  
 Meriden Brit. Co., Rogers 40, 15, 10, 5¢  
 C. Rogers & Bros. 40, 15, 10, 5¢  
 Rogers & Bros. 40, 15, 10, 5¢  
 Reed & Barton 40¢105  
 Wm. Rogers Mfg. Co. 40, 15, 10, 5¢  
 Simpson, Hall, Miller & Co. 40, 15, 10, 5¢  
 Roimes & Edwards Silver Co. 40, 15, 10, 5¢  
 L. Boardman & Son 40, 15, 10, 5¢  
 Miscellaneous.  
 Holmes & Edwards Silver Co.:  
 No. 67 Mexican Silver 50¢105  
 No. 30 Silver Metal 50¢105  
 Nickel Silver 50¢105  
 No. 50 Nickel Silver 50¢  
 No. 49 Nickel Silver 50¢105  
 German Silver 50¢50¢5¢  
 German Silver, Hall & Efton 50¢5¢ cash  
 Nickel Silver 50¢50¢105 cash  
 Britannia 50¢  
 Boardman's Nickel Silver 50¢5¢ cash  
 Boardman's Britannia Spoons, case lots 60¢5¢ cash  
 Springs, Door.  
 Torrey's Rod, regular size 40¢105  
 Gray's, 40¢, \$20.00 20¢  
 Bee Rod 40¢, \$20.00 20¢  
 Warner's No. 1, 40¢, \$25.00 20¢  
 \$5.30 40¢105  
 Gem (Coll), list April 19, 1889 10¢  
 Star (Coll), list April 19, 1889 10¢  
 Victor (Coll) 60¢60¢105  
 Champion (Coll) 60¢105  
 Philadelphia 5 in. 50¢, 8 in. 75¢, 10 in. 100¢  
 Cowell's No. 1, 40¢, \$18.00; No. 2, \$15.00 40¢  
 Rubber, complete, 40¢, \$4.50 55¢105  
 Hercules 50¢  
 Shaw Door Check and Spring 25¢30¢35¢  
 Elliptic, Concord, Platform and Half 60¢60¢5¢  
 Cliff's Bolster Springs 25¢  
 Squares—  
 Steel and Iron 75¢105  
 Nickel-Plated, full ex. 105¢  
 Try Square and T Bevels 60¢105  
 Diastion's Try Square and T Bevels 45¢105  
 Winterbottom's Try and Miter 30¢105  
 Starrett's Micrometer Caliper Squares 25¢  
 Avery's Flush Bevel Squares 40¢  
 Avery's Bevel Protractor 40¢  
 Squeezers.  
 Fodder—  
 Blair's 40¢20¢  
 Blair's "Climax" 40¢105  
 Lemon—  
 Porcelain Lined, No. 1 40¢60¢  
 Wood, No. 2 40¢60¢  
 Wood, Common 40¢105  
 Dunlap's Improved 40¢105  
 Sammis, No. 1, \$5.00; No. 2, \$4.00 12¢  
 \$18 40¢105  
 Jennings' Star 40¢105  
 The Boss 40¢105  
 Dean's, Nos. 1, 40¢65¢; 2, \$3.35; 3, \$1.90 40¢105  
 Little Giant 60¢60¢105  
 King 40¢5¢  
 Hotchkiss Straight Flash 40¢105  
 Standard Fiber Ware—See Ware, Standard Fiber.  
 Staples.  
 Blued.  
 Barbed, 1/2 in. and larger 75¢85¢  
 Barbed, 3/4 in. 85¢90¢

Fence Staples, Galvanized. Same price  
 Fence Staples, Plain. See Trd. Rep.  
 Steelyards. 40¢105  
 Stocks and Dies—  
 Blacksmith's 30¢50¢30¢105  
 Waterford Goods 30¢50¢30¢105  
 Butterfield's Goods 30¢50¢30¢105  
 Lighting Screw Plates 25¢20¢  
 Reece's New Screw Plates 35¢50¢40¢  
 Reversible Ratchet 30¢  
 Gardner 25¢  
 Stops, Bench.  
 Morrill's 40¢20¢  
 Hotchkiss 40¢20¢  
 Weston's, No. 1, \$10; No. 2, \$20 25¢105  
 McGill's 40¢20¢  
 Cincinnati 25¢105  
 Stone—  
 Hindostan No. 1, 3¢; Axe, 3 1/2¢; Slips No. 1, 4 1/2¢  
 Sand Stone 25¢  
 Washita Stone, Extra 10¢20¢  
 Washita Stone, No. 1 14¢15¢  
 Washita Stone, No. 2 10¢11¢  
 Washita Slips, No. 1, Extra 30¢35¢  
 Washita Slips, No. 1 34¢25¢  
 Arkansas Stone, No. 1, 4 to 6 in 15¢  
 Arkansas Stone, No. 1, 6 to 9 in 18¢  
 Turkey Oil Stone, 4 to 8 in 40¢  
 Turkey Slips 40¢105  
 Lake Superior, Chase 10¢  
 Lake Superior Slips, Chase 31¢32¢  
 Seneca Stone, Red Paper Brand 18¢20¢  
 Seneca Stone, High Rounds 20¢25¢  
 Seneca Stone, Small Whets 24¢24¢  
 Stove Polish—See Polish, Stove.  
 Stretchers, Carpet.  
 Cast Steel, Polished 40¢22¢  
 Cast Iron, Steel Points 40¢80¢  
 Socket 40¢105  
 Millard's 25¢25¢105  
 Straps, Razor—  
 Genuine Emerson 60¢60¢5¢  
 Imitation 40¢20¢105  
 Torrey's 20¢  
 Badger's Belt and Com. 40¢22¢  
 Lamont Combination 40¢24¢  
 Jordan's Pat. Padded, list Nov. 1, 89 50¢  
 Electric list net  
 Stuffers or Fillers, Sausage—  
 Miles' "Challenge," 40¢20¢50¢5¢  
 Perry 40¢20¢, No. 1, \$15.00; No. 0, \$21.00 50¢50¢105  
 Draw Cut No. 4, each \$30.00 20¢  
 Enterprise Mfg. Co. 20¢105  
 Silver's 40¢105  
 Sweepers, Carpet.  
 Hassell No. 5 40¢20¢  
 Hassell No. 7 New Drop Pan 40¢20¢  
 Hassell, Grand 40¢20¢  
 Grand Rapids 40¢20¢  
 Crown Jewel, No. 1, \$18.00; No. 2, \$19.00; No. 3, \$20.00 40¢105  
 Magic 40¢20¢  
 Jewel 40¢20¢  
 Improved Parlor Queen 40¢20¢  
 Nickleled 40¢20¢  
 Japanned 40¢20¢  
 Excelsior 40¢20¢  
 Garland 40¢20¢  
 Parlor Queen 40¢20¢  
 Housewife's Delight 40¢20¢  
 Queen, with band 40¢20¢  
 King 40¢20¢  
 Weed, Improved 40¢20¢  
 Hub 40¢20¢  
 Cog Wheel 40¢20¢  
 Conqueror 40¢20¢  
 Easy 40¢20¢  
 Monarch 40¢20¢  
 Goshen 40¢20¢  
 Advance 40¢20¢  
 Ladies' Friend, No. 1, 40¢20¢  
 No. 2 40¢20¢  
 American 40¢20¢  
 Grand Republic 40¢20¢  
 Tacks, Brads, &c.—  
 Carpet Tacks—  
 List Oct. 19, 1889, extra 10¢2¢ cash.  
 American Iron, Blued 70¢  
 American Iron, Tinned or Cop'd 70¢  
 Steel, Plain or Bright 70¢  
 Steel Tinned or Coppered 70¢  
 Swedes Iron, Blued 70¢  
 Swedes Iron, Tinned or Cop'd 70¢  
 American Iron Cut Tacks 70¢  
 Swedes Iron Upholster's Tacks, S.S. 70¢  
 Swedes Iron Upholster's Tacks, Tinned, S.S. 70¢  
 Swedes Iron Card and Upholster's Tacks, Lanc 60¢5¢  
 Swedes Iron Card and Upholster's Tacks, Tinned, Lanc 60¢5¢  
 Gimp and Lace Tacks, Lanc, Swedes Iron 60¢5¢  
 Gimp and Lace Tacks, Lanc, Swedes Iron, Tinned 60¢5¢  
 Gimp and Lace Tacks, S.S. 70¢  
 Gimp and Lace Tacks, Tinned, S.S. 70¢  
 Swedes Iron Basket or Trimmers Tacks, Lanc 60¢5¢  
 Miners' Tacks, S.S. 70¢  
 Bill Posters' or Railroad Tacks, Lanc, Swedes 60¢5¢  
 Bill Posters' or Railroad Tacks, S.S. 70¢  
 Copper Tacks 50¢  
 Copper Finish & Trunk Nails 50¢  
 Clear Box Nails 50¢  
 Zinc Glaziers' Points 50¢  
 Picture Frame Points 50¢  
 Looking-Glass Tacks 50¢  
 Brush Tacks 50¢  
 Tin-Capped Trunk Nails 50¢  
 Finishing Nails 50¢  
 Trunk & Clout Nails, Black & Tin 60¢5¢  
 Common and Patent Brads 60¢  
 Hungarian Points 60¢  
 Basket and Chair Nails 60¢  
 Lathered Carpet Tacks 40¢  
 Miscellaneous—  
 Double Pointed 85¢4¢  
 Wire Carpet Nails 60¢105





